# INVENTORY OF POLICY INTERVENTIONS – NIGERIA

## DRAFT

## POWER AFRICA TRANSACTIONS AND REFORMS PROGRAM (PATRP)

OCTOBER 15, 2015

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The following draft report falls within the Policy Work Order (WO-17-US-03) of Power Africa/PATRP (PATRP Objective 4b). This draft report was primarily generated by reviewing and analyzing published material on Nigeria's energy sector, a non-exhaustive list of which is included in the References section. In addition, the report draws upon, and incorporates the collective expertise provided by PATRP's in-country team and other technical advisory staff. In particular, the insights provided by the in-country team have ensured that any policy interventions that we have proposed are focused on removing barriers to advancing actual or prospective Power Africa transactions.

In its current draft form, this report represents a working document that will be shared, and discussed further, with USAID. Therefore, any policy interventions included herein are preliminary in nature. Upon further direction by USAID, our recommended policy interventions can be augmented and verified by means of in-country due diligence assessments.

This draft report was submitted for review to the Activity Manager leading the Power Africa Policy Work Order on 15 October 2015.

**Report Compilation Team**

| | |
|---|---|
| **Authors** | Shaun Nel, Nicholas Saunders |
| **Gender section author** | Karen Stefiszyn |
| **Appendix A authors** | David Hunt, Tom Simpson, Georgia Iordanescu, Jennifer Ifeanyi-Okoro |
| **Editor** | Wynne Cougill |
| **Review panel** | Anton Eberhard, Ria Govender, David Hunt, Tom Simpson, Jennifer Ifeanyi-Okoro |
| **Research assistants** | David Jones, Thomas Herbert, Amé Viljoen |
| **Work order team lead** | Ria Govender |
| **Work order supervisor** | Llyr Rowlands |

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# ACRONYMS

| Acronym | Definition |
|---|---|
| AFD | Agence Française de Développement (French Development Agency) |
| AfDB | African Development Bank |
| BPE | Bureau of Public Enterprise |
| BTG | Beyond the Grid |
| CAPEX | Capital Expenditure |
| CBN | Central Bank of Nigeria |
| DfID | Department for International Development |
| DisCo | Distribution Company |
| EASE | Energizing Access to Sustainable Energy |
| ECN | Energy Commission of Nigeria |
| EEDC | Enugu Electricity Distribution Company |
| EIA | Environmental Impact Assessment |
| EPC | Engineering, Procurement and Construction |
| EPSRA | Electrical Power Sector Reform Act |
| EU | European Union |
| FGN | Federal Government of Nigeria |
| FMoF | Federal Ministry of Finance |
| GenCo | Generation Company |
| GW | Gigawatt |
| HR | Human Resources |
| IBRD | International Bank for Reconstruction and Development |
| ICRC | Infrastructure Concession Regulatory Commission |
| IOC | International oil company |
| IPP | Independent power producer |
| JICA | Japan International Cooperation Agency |
| MHI | Manitoba Hydro International |
| MO | Market operator |
| MOP | Ministry of Power |
| MPR | Federal Ministry of Petroleum Resources |
| MW | Megawatt |
| MWh | Megawatt Hour |
| MYTO | Multi-Year Tariff Order |
| NA | Not applicable |
| NBET | Nigerian Bulk Electricity Trading Company |
| NCP | National Council on Privatization |

| Acronym | Definition |
|---|---|
| NDPHC | Niger Delta Power Holding Company |
| NELMCO | Nigerian Electricity Liability Management Company |
| NEMP | National Energy Master Plan |
| NERC | Nigerian Electricity Regulatory Commission |
| NESI | Nigerian Electricity Supply Industry |
| NESP | Nigerian Energy Support Program |
| NGC | Nigerian Gas Company |
| NEPA | National Electric Power Authority |
| NIPP | National Integrated Power Project |
| NNPC | Nigerian National Petroleum Agency |
| NREEEP | National Renewable Energy and Energy Efficiency Policy |
| O & M | Operations and Maintenance |
| PATRP | Power Africa Transactions and Reforms Program |
| PHCN | Power Holding Company of Nigeria |
| PPA | Power purchase agreement |
| PPP | Public private partnership |
| PRG | Partial risk guarantee |
| PROPARCO | Development Financial Institution focused on private sector – Subsidiary of the French Development Agency (AFD) |
| PTFP | Presidential Task Force on Power |
| PV | Photovoltaic |
| REA | Rural Electrification Agency |
| RE | Renewable energy |
| REEEP | Renewable Energy and Energy Efficiency Program |
| REF | Rural Electrification Fund |
| REMP | Renewable Energy Master Plan |
| SO | System operator |
| TCN | Transmission Company of Nigeria |
| T & D | Transmission and Distribution |
| TEM | Transitional Electricity Market |
| TSP | Transmission service provider |
| TUOS | Transmission use of service/system |
| UN | United Nations |
| UNIDO | United Nations Industrial Development Organization |
| USAID | United States Agency for International Development |
| USD | United States Dollars |
| USG | United States Government |
| WB | World Bank |

# EXECUTIVE SUMMARY

Nigeria has progressed further in its power sector reforms than any other African country. It has unbundled generation, transmission and distribution; it has sold its generation and distribution companies; and it has established a bulk electricity trader to manage contracts between participants in the sector. Nigeria also has more IPP capacity and investment than any other African country (with the exception of South Africa).

Yet Nigeria faces huge challenges in implementing further reforms, increasing investment and achieving financial sustainability in the power sector. Available generation capacity is a fraction of what is needed. With a population of more than 170 million, Nigeria has less than 4 GW of available generation capacity, compared to South Africa's available capacity of around 32 GW, despite South Africa having a smaller economy and population than Nigeria's.

Not enough revenue is flowing from customers to electricity distribution companies (DisCos) through the market operator and bulk trader to generation companies (GenCos) and gas suppliers. The regulator has exacerbated the situation through arbitrary changes to tariffs, which have further threatened the financial viability of DisCos.

Nigeria's path to energy reform has not been smooth. There have been delays and a lack of purposeful action in resolving core challenges around financial sustainability, although it has to be recognized that the Federal Government of Nigeria (FGN) continues to intervene to shore up the reforms. The recent intervention of the Central Bank of Nigeria in creating the Nigeria Electricity Market Stabilization Facility (NEMSF) is a case in point. However, like many African countries, there is a gap between policy formulation and policy implementation. Nigeria has a new government and there is potential for reinvigorating power sector reforms. The next steps in further reform should be:

- Further development of the blueprint for power sector reform including the creation of a framework for converting energy strategies to actionable programs with defined activities with timelines;
- Securing the financial viability of DisCos so that the financial sustainability of the sector can be assured;
- Capacity building for the new Nigeria Electricity Regulatory Commissioners so that credibility, transparency and predictability can be established in setting cost-reflective tariffs;
- The development and implementation of international competitive tenders for renewable energy projects;
- The development of a renewable energy policy and implementation plan to unlock its potential; and
- Enhanced capacity to expand access to electricity beyond the grid.

Nigeria has more people without electricity than any other country in the world, except India and the challenges in extending the grid and implementing parallel off-grid solutions are significant.

Table 1 below gives a high level overview of the key barriers identified and the technical assistance that can be given in order to enable the private sector to become a bigger participant in Nigeria's energy sector. Broadly speaking, with focused assistance in capacity building, policy implementation support and development and procedural efficiency, the fairly comprehensive set of energy policies, laws and regulations, can be transformed into improved implementation, including enhanced planning and efficient and effective procurement of power.

**TABLE 1: RECOMMENDED POLICY INTERVENTIONS**
**To Enable or Increase Private Sector Investment in Cleaner Power Generation and Widen Access to Electricity**

| Area of Focus | Barriers | Associated Principle | Recommended Intervention(s) *Prioritized by Impact* | Effect of Intervention | Technical Assistance Required |
|---|---|---|---|---|---|
| Energy policies | Power sector reform process and private investment in the sector is threatened by amongst other factors delays in activating contracts in the Transitional Electricity Market, non cost-reflective tariffs, and a failure to properly incentivize DisCos | Strong, transparent legal and regulatory frameworks | Further enhancement of the Blueprint for Power Sector Reform supported by an implementation plan | A more financially sustainable power sector with increased private investment | Assist FGN with enhancement of the power sector Blueprint drawing on the previous Power Sector Reform Roadmap of 2010 |
| Energy policies | Policy gaps that limit private sector participation in, and the expansion of, renewable energy resources | Sound, strategic and integrated power sector planning<br><br>Increased clean energy share<br><br>Adherence to internationally-recognized environmental and social standards and best practices | Development of a renewable energy policy and implementation plan | Diversification of the country's energy mix<br><br>Facilitate new connections in remote areas typically excluded from the grid due to insufficient infrastructure | Assist FGN with the development of a renewable energy policy and implementation plan |

| TABLE 1: RECOMMENDED POLICY INTERVENTIONS<br>To Enable or Increase Private Sector Investment in Cleaner Power Generation and Widen Access to Electricity | | | | | |
|---|---|---|---|---|---|
| Area of Focus | Barriers | Associated Principle | Recommended Intervention(s)<br>*Prioritized by Impact* | Effect of Intervention | Technical Assistance Required |
| Energy policies | Failure to implement policies regarding (i) off the grid rural electrification and (ii) energy efficiency | Increased clean energy share<br><br>Universal electricity access, achieved through the strategic use of on-grid, off-grid, and small-scale solutions | Review and finalization of off grid rural electrification and energy efficiency policies for implementation | Improved rural electrification and promotion of energy efficiency facilitating new connections to areas typically unconnected from the grid | Review and make recommendations on the current draft off grid rural electrification and energy efficiency policies so that they are finalized for implementation |
| Energy policies | The poorly functioning and managed Transmission Company of Nigeria (TCN), with insufficient investment, frustrates initiatives to increase the delivery of more electricity to the economy and households | Sound, strategic and integrated power sector planning | Development of a coherent implementation plan for reform of the transmission sector that also addresses all current ownership, management, funding, transactional and institutional challenges at TCN | Support in improving the transmission network will allow more power to be transmitted to more end users facilitating improved quality of electricity and new connections | Assistance with development of a coherent implementation plan for reform of the transmission sector including a succession plan for TCN post the MHI contract and the possibility of a further private management contract or concession |
| Energy laws | Regulation on National Content for Development of the Power Sector (2014) could create a major barrier to foreign investment | Streamlined and Transparent Processes for Project Development | Convince NERC not to implement the Regulation | Foreign investment in the sector encouraged | Inform NERC of the adverse impacts of implementing the Regulation, evaluate the apparent conflict with commitments under international treaties |

| TABLE 1: RECOMMENDED POLICY INTERVENTIONS<br>To Enable or Increase Private Sector Investment in Cleaner Power Generation and Widen Access to Electricity | | | | | |
|---|---|---|---|---|---|
| **Area of Focus** | **Barriers** | **Associated Principle** | **Recommended Intervention(s)<br>*Prioritized by Impact*** | **Effect of Intervention** | **Technical Assistance Required** |
| Energy regulatory framework and tariffs | Lack of cost reflective tariffs | Cost reflective retail tariff structures | Development of capacity in NERC to achieve transparent, credible and predictable determinations of cost reflective tariffs for the distribution and transmission sectors | Cost reflective tariffs are necessary to improve credit-worthiness of DisCos and foster financial sustainability that enhances prospects of private sector participation within the energy sector<br><br>Address funding constraints to maintenance and development of infrastructure | Assist NERC (and new Commissioners) to develop capacity to implement transparent, credible and predictable tariffs that are cost reflective and support the financial sustainability of the sector |
| Power sector development plans/integrated resource plans/generation master plans | Lack of long-term certainty of electricity supply industry | Sound, strategic and integrated power sector planning | Development of an Integrated Resource Plan (IRP), and ongoing planning capacity that will facilitate the procurement of new generation capacity | Utilization of the country's diversified energy resources to meet demand, on a cost effective basis | Assist in the formulation of an IRP, integrated demand modeling, least-cost supply options, and the development of a price path<br><br>Development of capacity to undertake frequent updates of the IRP |

**TABLE 1: RECOMMENDED POLICY INTERVENTIONS**
**To Enable or Increase Private Sector Investment in Cleaner Power Generation and Widen Access to Electricity**

| Area of Focus | Barriers | Associated Principle | Recommended Intervention(s) *Prioritized by Impact* | Effect of Intervention | Technical Assistance Required |
|---|---|---|---|---|---|
| Power generation procurement framework and processes | Lack of a competitive procurement framework to unlock full clean energy potential | Clear and transparent procurement processes<br>Increased clean energy share | Development and implementation of a competitive procurement framework for clean energy | Generate more clean energy projects to meet growing demand for energy<br>Has the potential to decrease the costs of energy supply at a rapid rate | Support current efforts at NBET to design a competitive power procurement framework and supporting RFP package including standardized PPA and other commercial contracts for implementation<br>Support efforts by other donors to evaluate the grid for opportunities to integrate renewables into the grid |
| Electrification targets, planning and execution (for grid and off-grid) | Failure to achieve electrification goals as a result of:<br>(i) lack of political support for planning and co-ordination,<br>(ii) small scale of projects limits commercial developer interest,<br>(iii) lack of financing options, and<br>(vi) lack of technical capacity | Increased clean energy share<br><br>Universal electricity access achieved through the strategic use of on-grid, off-grid, and small-scale solutions | Development of modeling and planning capacity in the REA and assistance in the operationalization of the REF | Achieve country's electrification goals for grid and off-grid | Assistance with modeling and planning capacity in the REA and assistance in the operationalization of the REF<br><br>Assistance to developers on modeling, planning and capacity in order to access donor finance and find qualified personnel |

**TABLE 1: RECOMMENDED POLICY INTERVENTIONS**

**To Enable or Increase Private Sector Investment in Cleaner Power Generation and Widen Access to Electricity**

| Area of Focus | Barriers | Associated Principle | Recommended Intervention(s) *Prioritized by Impact* | Effect of Intervention | Technical Assistance Required |
|---|---|---|---|---|---|
| Gender equality and female empowerment | Risk of insufficient awareness of the need to implement gender-sensitive policy provisions; insufficient provisions for women's participation in training and development and to serve on the Regulatory Commission and REA | Gender equality and female empowerment | Build capacity in gender mainstreaming, promote women's participation in training and development activities as well as on the Regulatory Commission and REA.<br><br>Develop awareness of the benefits of women's participation in the general workforce | Strengthened implementation of the National Energy Master Plan (NEMP) action plan on gender issues and increased women's participation in the sector | Gender mainstreaming workshop and resources, and promotion of women in the sector through Power Africa's Women in African Power Network |

# 1 PROFILE OF NIGERIA'S ENERGY SECTOR

## 1.1 GENERATION CAPACITY AND MIX

Nigeria currently has 23 grid-connected generating plants, with a total installed capacity of 14,2 GW and an available capacity of less than 4 GW, after capacity factors and gas supply constraints are factored in.[1] Table 2 shows the installed capacity per generation plant. Most generation is thermal based, with the remainder being accounted for by three major hydropower plants.[2]

**TABLE 2: INSTALLED ELECTRICAL CAPACITY**

| Plant | License Type[3] | Technology | Installed Capacity 2013 (MW) Less Decommissioned Units[4] |
|---|---|---|---|
| Residual State Owned | | | 571 |
| Ibo Power | NA | Natural Gas | 190 |
| Ormolu, Rivers State | NA | Natural Gas | 150 |
| Rivers IPP, Rivers State | NA | Natural Gas | 95 |
| Trans-Amado, Rivers State | NA | Natural Gas | 136 |
| PHCN Successors | | | 7,038 |
| Jabber | NA | Hydro | 578 |
| Kanji | NA | Hydro | 760 |
| Shirr | NA | Hydro | 600 |
| Adam IV/V | NA | Natural Gas | 776 |
| Eglin | NA | Natural Gas | 1320 |
| Greg I | NA | Natural Gas | 414 |
| Olorunsogo I | NA | Natural Gas | 335 |
| Omotosho I | NA | Natural Gas | 335 |
| Sapele | NA | Natural Gas | 1,020 |
| Ughelli Delta | NA | Natural Gas | 900 |
| NIPP | | | 5,453 |
| Alaoji | NA | Natural Gas | 1131 |
| Benin/Ihovbor | NA | Natural Gas | 507.6 |
| Calabar | NA | Natural Gas | 634.5 |
| Egbema | NA | Natural Gas | 380.7 |

[1] (The Presedential Task Force on Power Generation Report , 2015) accessed at http://nigeriapowerreform.org/dash/dailygen/index.php

[2] (What Power Africa Means for Nigeria, 2015; International Energy Agency, 2012) lists the generation input mix at between 70-80% thermal; and 20-30% from hydro electrical.

[3] Embedded generation, also referred to as distributed generation, describes generation directly linked to a distribution network i.e., bypassing the national grid. Captive power generation means the generation of electricity exceeding 1 MW for the purpose of consumption by the generator and not sold to a third party.

[4] (Overview of the Nigeria Energy Sector, 2015)

| TABLE 2: INSTALLED ELECTRICAL CAPACITY | | | |
|---|---|---|---|
| Plant | License Type[3] | Technology | Installed Capacity 2013 (MW) Less Decommissioned Units[4] |
| Gbarani | NA | Natural Gas | 253.8 |
| Geregu II | NA | Natural Gas | 506.1 |
| Ogorode | NA | Natural Gas | 507.7 |
| Olorunsogo II | NA | Natural Gas | 754 |
| Omoku | NA | Natural Gas | 264.7 |
| Omotosho II | NA | Natural Gas | 512.82 |
| IPPs | | | 1,540 |
| Aba Integrated [5] | Embedded | Natural Gas | 140 |
| AES, Lagos | Connected | Natural Gas | 270 |
| Afam VI | Connected | Natural Gas | 650 |
| AGIP, Okpai | Connected | Natural Gas | 480 |
| Captive Plant[6] | | | 168 |
| Akute, Lagos | Captive | NA | 12.5 |
| Alausa, Lagos | Captive | NA | 10 |
| Island, Lagos | Captive | NA | 10 |
| Obajana | Captive | NA | 135 |
| Total | | | 14,198 |

## 1.2 ELECTRICITY ACCESS LEVEL AND TARGETS

Shortages exist on Nigeria's grid, preventing it from providing the requisite amount of electricity demanded. The International Energy Agency's 2014 *African Energy Outlook* places Nigeria's national electrification rate at 45%, leaving almost 93 million people without electricity.[7] The lack of access to electricity is exacerbated by the large tracts of rural areas that are too remote to have access to the grid, making the rural electrification rate (35%) substantially less than the urban electrification rate (55%).[8] Thus, increasing access to electricity is not limited to removing generation constraints, but also to extending the grid and looking at off-grid solutions for rural areas. The Social-Economic survey conducted by the National Bureau of Statistics showed that while the challenge of lack of electricity supply is prevalent across Nigeria, the Northern part of the country suffers more.[9] Table 3 summarizes the current state of Nigeria's electrification and the Federal Government of Nigeria's

[5] Construction of the Aba Integrated IPP is complete, but not yet delivering power due to the ongoing distribution licencing dispute between Aba Electricity Distribution Company (Aba DisCo) and the Enugu Electricity Distribution Company (EEDC). (Adigun, 2015).

[6] Captive generation plants are not true IPPs, but are tantamount to self-generation, which is ubiquitous in Nigeria. (Eberhard & Gratwick, 2012) put self-generation at anywhere between 4,000 – 8,000 MW. An analysis of off-grid licensees' capacity listed by NERC places off-grid generation capacity at 306 MW. (NERC Licencees, 2015).

[7] The World Bank World Development Indicators list the access to electricity as 55.6% of the total population.

[8] (Africa Energy Outlook, 2014)

[9] (National Bureau of Statistics, 2015)

(FGN) targets of 75% of the population (rural or urban) to be electrified by 2020 and universal coverage by 2030.[10] To date, electrification targets have not been met.[11]

| TABLE 3: ELECTRICITY ACCESS LEVELS IN NIGERIA | | |
|---|---|---|
| Year | Access Indicator | % of Population |
| 2012 (historic) | Overall access: | 45% |
| | Urban access: | 55% |
| | Rural access: | 35% |
| 2022 (target) | Overall access: | 75% |
| 2030 (target) | Overall access: | 100% |

Source: Africa Energy Outlook, 2014.

## 1.3 POWER MARKET STRUCTURE, INCLUDING IPP PARTICIPATION

Nigeria has embarked on an important sector reform effort. Initiated in 2001 with the publication of a new power policy, the objectives of the reforms were to improve efficiency, attract private participation, and strengthen power sector performance to enable economic and social development.

In 2005, the National Electric Power Authority (NEPA) was renamed the Power Holding Company of Nigeria (PHCN) with a view to selling its assets to the private sector in order to combat insufficient and unreliable electricity supplies. The FGN decided to implement a phased liberalization process, whose main characteristics are:

- Vertical unbundling of generation, transmission and distribution
- Horizontal unbundling and privatization of independent PHCN successor companies
- Anchoring the sector through system and market operators that jointly serve as the link in the system.

The reform process gained renewed impetus in recent years with the privatization of the nine successor generating companies (successor GenCos) and ten of eleven successor distribution companies (successor DisCos).

The transmission entity created through the unbundling of the PHCN is the Transmission Company of Nigeria (TCN). Despite the requirements of law, TCN remains a parastatal and this fact has been a key barrier to implementation of reforms. TCN is wholly owned by the FGN.

The Nigerian Bulk Electricity Trading entity (NBET) was also created. NBET is jointly owned by the Bureau of Public Enterprises (BPE), which has an 80% stake, and the Ministry of Finance Incorporated which holds the balance, 20%.

Once the decision to unbundle and privatize the NEPA/PHCN was taken, no investment in additional capacity was to be made through the PHCN. However, the need for additional energy remained. The government’s solution was to tap into a federal/state/local government account by creating a jointly owned program of investment in new power generation, transmission and distribution called the

[10] (Africa Energy Outlook, 2014; National Energy Policy, 2003)

[11] (Prof. Eberhard, 2015)

National Integrated Power Project (NIPP). Pursuant to this, a separate holding company, the Niger Delta Power Holding Company (NDPHC), was incorporated in 2005 to manage the USD 8.4 billion investment in NIPP assets. The NDPHC has constructed and is privatizing ten newly built generation plants, as well as the necessary transmission and distribution infrastructure, which are being built as part of the NIPP.

**IPP Participation**
Since private participation in the power sector was permitted in 1998, a number of independent power producers (IPPs) have entered the market.[12] There are currently three private IPPs supplying power to the national grid. They consist of those set up by international oil companies (IOCs) Shell and Agip in response to massive government subsidies, and one that for most of its history was run by the AES Corporation, although it has now been sold. A fourth IPP, Aba Integrated has been built but is not running because of a dispute around its license to supply power in the area. It aimed to supply industrial customers directly but the local DisCo argues that these are within its supply area. Four other generation plants were constructed by Rivers State and privatized, and a separate plant was constructed by and remains owned by Ibom State.

The FGN is focused on sustaining a stable investment climate for private sector participation in the power sector, expanding transmission and distribution networks to deliver power to customers, maintaining a creditworthy off-taker of electricity, establishing cost-reflective tariffs, and reducing inefficiency in support of affordable end-user tariffs.

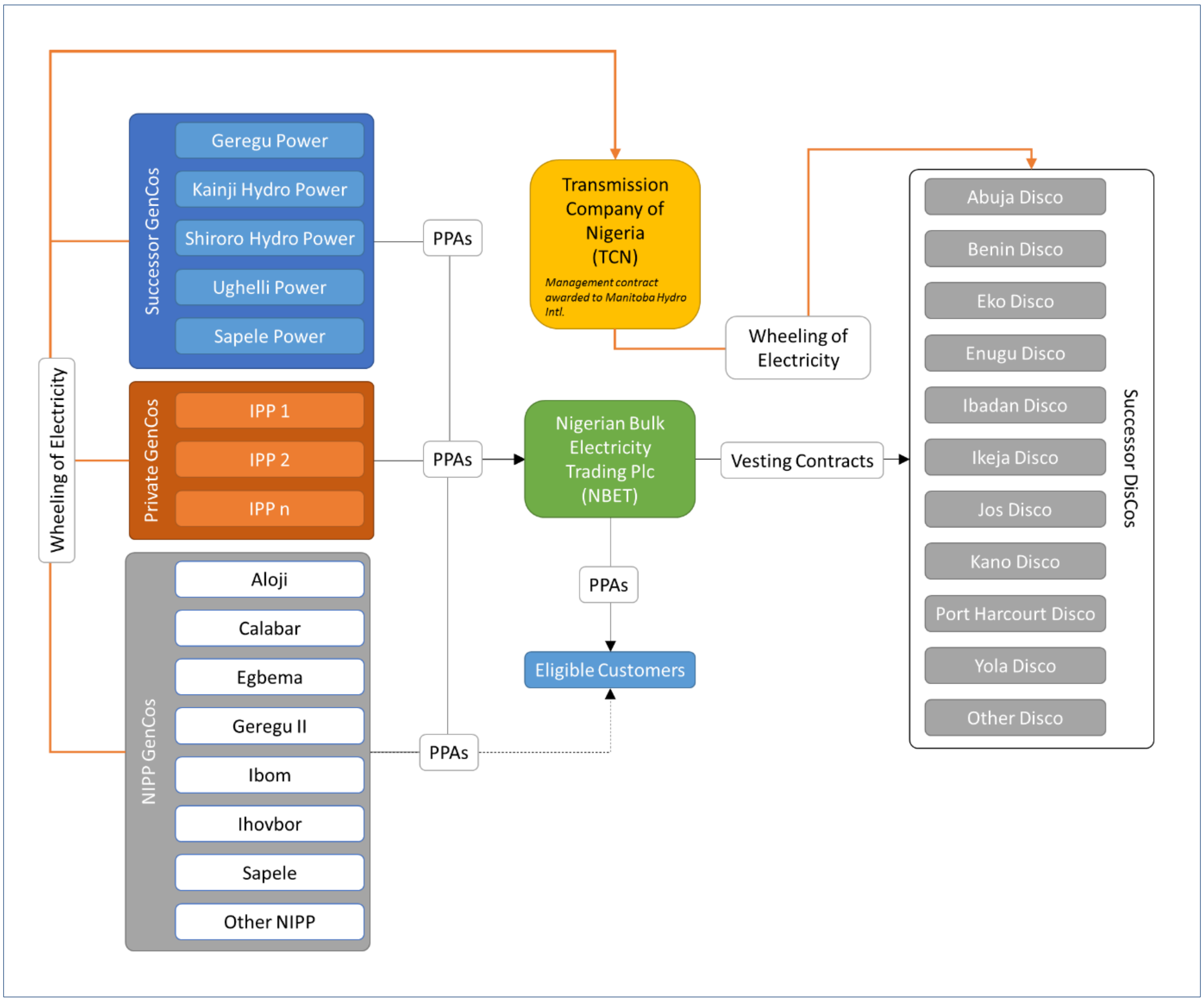
In early 2015, the FGN instructed the electricity market to operate in accordance with established contracts including the power purchase agreements (PPA) for generators and vesting contracts for the delivery of power to distribution companies. On February 1, 2015, Nigeria's Transitional Electricity Market (TEM)[13] was officially declared to be effective. This brought to a close the interim rules period the Nigerian Energy Regulatory Commission (NERC) had used to govern trading and commercial arrangements during the period between the privatization of PHCN and the declaration of the TEM. However, the electricity market, particularly trading arrangements, are not yet wholly contract governed since there is insufficient revenue flowing from customers through DisCos to GenCos and gas suppliers. Figure 1[14] displays the TEM's structure and the trading arrangements between electricity sellers and electricity buyers linked through the entities of the NBET and TCN.

[12] Private sector participation in power sector generation was permitted by the amendment of the Electricity Act 1990 via the Electricity (Amendment) Decree 1998, and amendment of the NEPA Act 1990 via the NEPA (Amendment) Decree 1998.

[13] The Transitional Electricity Market (TEM) was conceptualized in the Electric Power Sector Reform Act 2005

[14] Source: (Wonodi, 2013; Draft Internal PATRP BGT Assessment Report – Nigeria, 2015)

**FIGURE 1[15]: NIGERIA'S TEM STRUCTURE**




## 1.4 KEY SECTOR INSTITUTIONS AND MANDATES

The following organizations are most relevant in the country's energy sector:

**Ministry of Power (MOP)** Responsible for initiating and formulating broad power sector policies. The MOP is guided by the provisions of the Nigerian Electric Power Policy 2001 (NEPP), Electric Power Sector Reform Act 2005 (EPSRA), and the Roadmap for Power Sector Reform. MOP is accountable for:

- Implementing renewable energy and energy efficiency programs and initiatives[16]
- Promoting the development of hydropower plants through public private partnerships (PPPs)

[15] Note: Figure 1 does not reflect Olorunsogo1, Omotsho 1 and Egbin which collectively have over 1,900 MW capacity, a large percentage of the available capacity. Olorunsogo and Omotsho are privately owned while Egbin is partly owned by the FGN. Ibom is also not depicted.

[16] The MOP heads the Inter-Ministerial Committee on Renewable Energy and Energy Efficiency, composed of the NERC, REA, Energy Commission of Nigeria, Nigerian National Petroleum Commission, and Federal Ministry of Environment.

- Licensing privately owned generating sets that are under the threshold for NERC licensing (less than 1 MW) through the Electrical Inspectorate Service Department
- Supervising the following power sector related agencies/parastatals:
  - Rural Electrification Agency (REA)
  - Nigerian Electricity Liability Management Limited (NELMCO)
  - Nigerian Bulk Electricity Trading Company (NBET)
  - Transmission Company of Nigeria (TCN)
  - Niger Delta Power Holding Company.

**Ministry of Petroleum Resources (MPR)** has the mandate to initiate policies for the oil and gas sector and supervise their implementation. The Ministry has a technical Department of Petroleum Resources that undertakes the regulation of the oil and gas sector. Gas plays a critical role in Nigeria's power generation. Supply constraints in the form of inadequate gas transportation infrastructure and vandalism of existing infrastructure have delayed the signing of gas supply agreements, ultimately stalling privatization of the NIPP plants.

**Bureau of Public Enterprises (BPE)** serves as the secretariat of the National Council on Privatization (NCP)[17] and is charged with implementing the Council's policies on privatization and commercialization. BPE oversaw the privatization process of, among others, the electricity companies formerly owned by PHCN.

**Energy Commission of Nigeria (ECN)** is responsible for coordinating and supervising all energy functions and activities within each member state. The ECN is responsible for strategic planning and coordination of federal policies on energy.

**Nigerian Electricity Regulatory Commission (NERC)** is responsible for regulating the electricity sector through the development of codes, standards and regulations, issuing generation licenses and determining tariffs. The NERC has a Renewable Energy Research and Development Division, tasked with helping the Commission drive its renewable energy programs.

**Power Holding Company of Nigeria (PHCN)** was the initial holding company formed to take over from NEPA and under which the 17 successor companies[18] were subsequently privatized.

**Transmission Company of Nigeria (TCN)** is responsible for the operation and maintenance of the country's transmission system. TCN is currently managed by Manitoba Hydro International (MHI) on a short-term contract.

TCN is made up of three core business units: the transmission services provider (TSP), the system operator (SO) and the market operator (MO). TSP is responsible for constructing and maintaining the transmission system infrastructure. It outsources the construction of transmission works to private EPC contractors. SO manages the control function, including centralized dispatch at the National

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[17] The NCP is a government-sponsored body charged with the overall responsibility of formulating and approving policies on privatization and commercialization aligned with the political, economic and social objectives of the Nigerian Government.

[18] Ownership of four of the six generation companies and ten of the eleven distribution companies was transferred on November 1, 2013. The TCN and NBET, although resulting from the unbundling of the PHCN, are still government owned.

Control Center and field operations at the substations. MO is responsible for metering and invoicing market participants in coordination with NBET.

**Nigerian Bulk Electricity Trading Company (NBET)** was established by EPSRA and incorporated in July 2010; it is a federal government-owned public liability company, with BPE and the Ministry of Finance Incorporated as its main shareholders. It is responsible for:

- Entering into PPAs with IPPs and for selling on power to the 11 DisCos
- Managing escrow accounts
- Executing PPAs with state-owned and private power generation companies.

**Nigerian Electricity Liability Management Limited (NELMCO)** was established as a government special purpose vehicle to assume and manage extant liabilities and other obligations that were not transferred from PHCN to any of the successor companies. NELMCO was seen as a measure to increase the attractiveness of the successor assets to the private sector by reducing debt-laden balance sheets.[19]

**National Rural Electrification Agency of Nigeria (REA)** is responsible for extension of the main grid, development of isolated and mini-grids, and development of renewable energy sources.[20] REA also administers the Rural Electrification Fund (REF) to support electrification programs through public and private sector participation.[21]

**Niger Delta Power Holding Company (NDPHC)** is a special purpose company owned by federal, state and local governments. It is responsible for implementing the NIPP.[22] It was conceived as a fast-track government-funded initiative to stabilize the Nigerian power sector while the privatization efforts gained momentum. As part of its own privatization efforts, NDPHC plans to divest 80% of its ownership in 10 generation assets together with requisite transmission infrastructure.[23] This privatization has stalled, but sale of one power plant is expected at year end.

**Nigerian National Petroleum Corporation (NNPC)** owns oil and gas rights of FGN and in addition regulates and supervises the petroleum industry on behalf of the federal government. NNPC is responsible for FGN involvement in both upstream (through joint ventures with IOCs) and downstream development (it owns the Nigeria Gas Company, which owns the parastatal gas pipeline network).

**Nigerian Gas Company Limited (NGC)** is a subsidiary of the Nigerian National Petroleum Corporation It is responsible for the transportation of natural gas through its pipeline network.

## 1.5 STATE OF THE UTILITY

The PHCN has now been privatized to the extent currently planned,[24] although the privatization of TCN is a possibility. The planned divestiture of NIPP power plants has been stalled and has missed its

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[19] (The Energy Blueprint Action Plan 2015 – 2017, 2015).

[20] (Beyond the Grid Assessment - Nigeria, 2015).

[21] (Investment Brief - Nigeria, 2015).

[22] (Beyond the Grid Assessment - Nigeria, 2015).

[23] (Investment Brief - Nigeria, 2015).

[24] The handover of 15 successor companies took place on November 1, 2013.

target timeframe.[25] Once privatization of the NIPPs is complete, apart from non-controlling equity stakes retained in some GenCos and DisCos, the FGN will have effectively removed itself from the power generation and distribution business. Currently the FGN itself only maintains control over the electricity bulk buyer (Nigerian Bulk Electricity Trading Company) and the Transmission Company of Nigeria. NDPHC, a FGN/state local government owned company retains control of the NIPP power plants (to be privatized) and transmission projects (to be transferred to TCN).

**NBET's Funding and Credit Surety.** NBET is structured as a revenue-neutral institution. It serves as the intermediary between GenCos on the one side, and DisCos and eligible customers who buy directly from NBET on the other. Payments are made into market clearing accounts from DisCos and eligible customers for power supplied. These payments are to be made under the terms of "vesting contracts" representing a pass through of amounts paid under PPAs but at present only partial payments are being made. These payments are transferred to NBET and from NBET to GenCos and service providers.

Although intended to be a flow through entity that assumes no risk, this proved impractical to achieve. As a market-building institution, it bears off-taker, market and payment default risks. It may also be required to take on certain risks that are under the control of the FGN or state-owned entities. As a recourse, it operates the electricity market without any sovereign guarantees. Thus, any contingent liabilities that occur lie with NBET and not the FGN. This distinction is important with reference to the operation of credit enhancements such as the World Bank partial risk guarantee (PRG) with respect to payments under PPAs and certain gas supply agreements.

NBET's liquidity position is central to the cash management cycle of the power value chain. The FGN has assured the industry that NBET will have a capitalization fund of about USD 800 million. This is mainly composed of:

- USD 80 million allocation from the federal budget;
- USD 350 million from the proceeds of the USD 1 billion FGN Eurobond issued in 2013;
- ₦50 billion (USD 312 million) of the proceeds from the privatization of the PHCN DisCos and GenCos held in escrow;
- Two smaller escrow agreements relating to privatized power plants.

The DisCos are also expected to submit a letter of credit that covers three months of payments to the GenCos.

These funding facilities aim to assure wholesale PPA payments for about 6 to 8 months. While this would appear to be an adequate buffer under normal circumstances, with post-privatization it is likely that the FGN will need to inject more liquidity into the sector than it anticipated. Indeed, this has already happened with the Central Bank of Nigeria's Nigeria Electricity Market Stabilization Facility. Work to date has established NBET as a *credible* off-taker, as opposed to a creditworthy offtaker[26], and the current market should work for the intermediate term provided key elements of the structure are maintained and NBET reserves are not used as a source of cash for other purposes. NBET should continue to receive assistance on credit enhancement mechanisms by building

[25] Privatization (hand over to new owners) of NIPPs was initially planned for June 2014.

[26] A creditworthy offtaker must have a significant payment history, which NBET has not had the opportunity to develop.

expertise, balancing of revenues and costs, and procurement of PPAs and due diligence, including put call option agreements and World Bank PRGs.

**TCN and Transmission Infrastructure Investment Shortfall.** Transmission is a critical aspect of Nigeria's power value chain. The newly-privatized GenCos and the IPPs can ramp up available capacity closer to installed capacity; the DisCos can improve their distribution networks, optimize metering and improve collections efficiency; and the gas supply and the gas transportation pipeline network can be made fit for domestic purposes. However, if it is not possible to transmit the electricity produced by the GenCos to the DisCos consistently and effectively, the entire system will collapse figuratively and physically. There are serious concerns around management capability and stability at TCN. Relationships between local management and the management contractor, MHI, have been dysfunctional at times, and the current management staff within TCN are ill prepared to take over without significant capacity building. In addition, TCN has not been investing in building adequate transmission infrastructure and many projects that have started are delayed primarily due to funding gaps. Some donor funded transmission projects are on track but it would be fair to say that too little is being done too late.

**DisCo Performance.** Technical and non-technical losses represent a significant portion of the energy produced; for example; distribution losses are in the range of 30-50% and some DisCos experience a 55% commercial loss due to electricity theft.[27] Perhaps the biggest challenge to the sustainability of the power sector market reforms is the need to reduce technical and commercial losses in the DisCos. A majority of DisCos have proven unable to make progress on reducing technical and commercial losses. While a portion of the problem relates to inadequate revenues due in part to tariffs below a cost recovery level, management of these DisCos must be considered responsible for a large portion of the lack of progress. A major related issue relates to excessive use of leverage to acquire ownership in DisCos, which has decreased funds available for investment.

[27] (Beyond the Grid Assessment - Nigeria, 2015)

# 2 NIGERIA’S ENERGY POLICY FRAMEWORK

This section reviews Nigeria’s relevant energy policies, laws, and regulatory framework, as well as its power sector development plans, procurement framework and processes, and electrification targets.

Over recent years, many policies have been updated to reflect the realities of the power sector, while regulation for generation, distribution and transmission has been elaborated on, due to the privatization of the Power Holding Company of Nigeria (PHCN) and the drive to make the private sector more attractive to investors. Figure 2 lists the major legislative, policy and regulatory documents for the energy, renewable energy and electrification subsectors in Nigeria, which are then described in greater detail in the subsequent subsections.

## 2.1 ENERGY POLICIES

**The National Energy Policy (NEP), 2003**

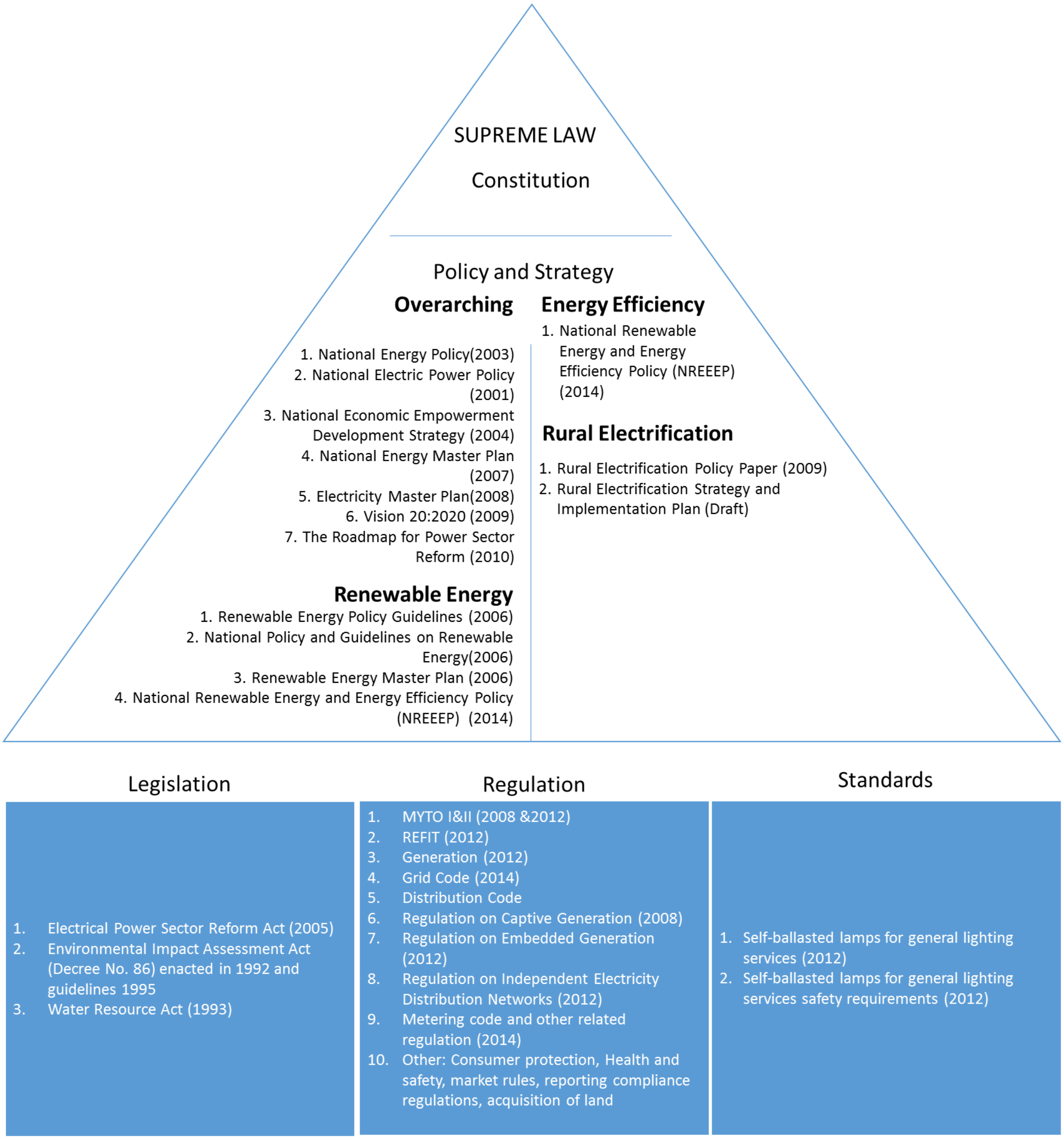
The overarching policy for the energy sector is the NEP, which was drafted and implemented by the Energy Commission of Nigeria (ECN) in 2003. The policy recognized that the government had not been able to keep up with national energy demand and that there were deficiencies in both funding and management. Consequently, the policy envisioned the need for private sector participation in order to attract the finance and expertise necessary to restructure the energy sector.

A draft revised energy policy was prepared in 2013 and is currently still under consideration. The revised policy is much the same as the original policy, but strategies for achieving objectives have been broken down into short-, medium- and long-term.

**The National Energy Master Plan (NEMP), 2007**

In order to provide a framework for the implementation of the National Energy Policy (2003), the NEMP was drafted in 2007. The revised draft NEMP seeks to achieve the goals of the revised National Energy Policy by converting strategies to actionable programs and activities with timelines. The NEMP seeks to promote increased investments and the development of energy sector industries with substantial private sector participation, to ensure sector development and foster international cooperation in energy trade in the African region.

**FIGURE 2: THE MAIN POLICY, LEGISLATIVE AND REGULATORY DOCUMENTS RELATED TO NIGERIA'S ENERGY SECTOR**




**The Roadmap for Power Sector Reform, 2010**

In 2010 the Presidential Task Force on Power (PTFP) published the Roadmap to Power Sector Reform, which sets out to emulate the successful approach taken in reforming the telecommunications sector. There was notable progress in implementing the 2010 Roadmap to start with, however government bureaucracy resulted in delays and missed targets. It also became evident that some of the assumptions in the 2010 plan had been too optimistic.

**The Roadmap for Power Sector Reform, Rev 1, 2013**

In 2013 the PTFP published a revised plan with a new set of assumptions to address cases of slipped projections in the 2010 Roadmap. Through a detailed technical process, the review reset the projections so as to re-commit the project owners to those Roadmap milestones that remained to be delivered. Other areas mentioned are:

- By the end of 2012 only 6,000 MW of generation capacity was technically available versus the 2010 projection of 11,680 MW.
- The projected 40,000 MW (by 2020) of the 2010 Roadmap was revised down to 28,000 MW.
- More attention is to be paid to solar energy, small hydro, wind and biomass in the medium to long term.
- A framework is to be established for private-sector driven off-grid power supply, especially in rural areas.
- The existing legislation does not sufficiently cover licensing for the exploitation of renewable energy sources.
- The policy on the development of renewable energy for the power sector is not clear.
- A renewable energy feed-in tariff should be developed by NERC.
- The FGN should become involved in financing renewable power generation.
- Renewable grid-connected sources are expected to contribute about 4% to the grid by 2020.

The Roadmap for Power Sector Reform – Revision I is, in theory, the current operating manual for the sector. The Roadmap identifies the main barriers affecting progress towards the full liberalization of, and the reduction in the supply/demand gap of the power sector.

The Roadmap is very limited in terms of renewable energy, energy efficiency and rural electrification. The core focus of the Roadmap was on other forms of energy delivery systems. In summary, it is the guiding high-level planning document of the administration, containing a review of the reform process until 2010 and a listing of actions for the next planning period based on checks of performance, development and progress.

**The Nigerian Power Sector Content Development Policy**
This policy, promulgated by NERC in 2014 in an apparently political move in anticipation of the upcoming elections, is expected to achieve capacity development and a greater utilization of Nigerians and Nigerian local content, thereby reducing the outflow of foreign exchange.

Although not effective to date, the policy will establish a strong preference for local sourcing of equipment and services applicable to NERC licensees in generation, transmission and distribution. Licensees would also have an obligation to maintain a "technology transfer plan" with details of the technologies used by the operator and proposed methods of transfer to Nigerians.

If implemented, this policy would create a major barrier to effectuating the other goals of energy policy since Nigeria lacks the necessary manufacturing capacity and work force, and foreign direct investment in Nigeria will be tied to foreign content for some time. In addition, the more advanced technologies will not be shared. Indeed, almost without exception IPP proposals would fail to meet the requirements of this policy.

**The National Policy on Public Private Partnership, 2009**
By developing a national policy on public-private partnerships (PPPs), the FGN recognizes that PPPs can potentially deliver significant benefits in the design, quality of services, and overall cost of infrastructure. In order to facilitate the PPP policy, the FGN is working to develop an enabling environment in the areas of policy and practices, legal, regulatory, financial and institutional frameworks.

Power generation plants and transmission and distribution networks are included in the scope of the policy, yet government decision makers have not reached an agreement on whether to allow private investment through PPP projects and regional concessions.

**The Renewable Energy Master Plan (REMP), 2005**

The Renewable Energy Master Plan (REMP), drafted by the Energy Commission of Nigeria and the United Nations Development Program (UNDP) in 2005 and reviewed in 2012, expresses Nigeria's vision and sets out a road map for increasing the role of renewable energy in achieving sustainable development.

**The National Renewable Energy and Energy Efficiency Policy (NREEEP), 2014**

NREEEP provides an overarching framework for renewable energy and energy efficiency, thereby functioning as an umbrella policy for the various existing documents and serving as a reference document (anchor) for concrete implementation measures.

While increasing progress has been made on the policy framework for renewable energies, there are still policy gaps that limit private sector participation and the expansion of renewable energy sources. To date, there is no policy to allow for regional variations of renewable energy sources to be factored into the determination of the electricity tariff, nor is there a consensus on the status of renewable energy projects in the procurement process.

**Policy Conclusions**

While policies cover all aspects of the energy sector, including renewable energy, energy efficiency, rural electrification and the introduction of IPPs, with the exception of the Roadmap, policy objectives are largely non-committal to milestones. Where targets have been defined, these have proven to be unrealistic with initial estimates by policy makers being overly optimistic. There is also a lack of institutional incentive to implement the policies, no attempt at monitoring and evaluation and with undefined key indicators to support policy implementation.

It is also noted that most of the strategy and policy documents for rural electrification, particularly off-grid and energy efficiency, remain in draft form and still need to be developed considering the sector's inherent realities.

## 2.2 ENERGY LAWS

The reforms outlined in the National Electric Power Policy (NEPP) were legislated through the Electric Power Sector Reform Act No. 6 of 2005. EPSRA has been the major piece of legislation that has defined and shaped restructuring and privatization of the Nigerian power sector.

EPSRA provides for the creation of key entities in the liberalized power sector, such as NERC. In addition, it gives guidance with regards to the issuance of licenses, calculation of tariffs, and land access rights. It also allows for the unbundling of the sector with the creation of TCN and NBET, and makes provisions for the creation of REA, including the Rural Electrification Fund.

While Nigeria has legislation for the establishment of power purchase agreements (PPAs), gaps remain in the legislation in regard to supporting cleaner power generation and wider access to electric power, such as the lack of specific provisions made for private transmission investment.

Energy efficiency still needs to be embraced by policy makers as a cost-effective tool to save electricity and to improve the reliability of the power system. The draft Energy Efficiency Bill still awaits enactment. Awareness creation measures are important as are mandatory standards and voluntary pilot projects in order to demonstrate the viability of this approach.

Various laws provide numerous incentives, such as the Nigerian Investment Promotion Commission Act of 2004 and the pioneer status under the Industrial Development (Income Tax Relief) Act of 2004. In 2012, the FGN, with a view to encouraging foreign direct investment, released certain regulations providing various tax reliefs to companies in the form of the Companies Income Tax (Exemption of Profits) Order 2012, which grants income tax exemption on 30% of the costs incurred in providing infrastructure or facilities such as roads, water and electricity of a public nature. An initial tax-free period of three years, renewable for an additional period of two years together with accelerated capital allowances and tax-free dividends are available to investors in the power sector that use gas.

## 2.3 ENERGY REGULATORY FRAMEWORK AND TARIFFS

**Capability and Independence of the Regulator.** The role of NERC, its independence, and its ability to use its regulatory powers effectively are crucial to the successful and profitable future of the Nigerian electrical power industry.

NERC initially demonstrated a commitment to carrying out its duties as an independent regulator. Its withdrawal from the Supervisory Board of TCN is an indication of this. However, it has been noted that NERC does not always apply best practices in regulating the transmission and distribution sectors. Decisions and pronouncements by the Commission in the months leading up to the recent presidential election have been seen as highly politicized and undermined NERC's credibility. The Chairman of NERC openly and actively campaigned for one presidential candidate. Distribution companies sent notices to BPE threatening to declare *force majeure* on their obligations under their privatization agreements because of the negative impact of these decisions and pronouncements, and the inconsistency NERC has demonstrated in the due process for issuing regulations, particularly with regard to tariffs. There have also been inconsistencies between different government agencies. This uncertainty has made it difficult for prospective lenders/investors to rely on any revenue projections.

The five-year tenure of the seven NERC commissioners comes to a natural end in December 2015 and this will prove an opportune time to provide capacity building to NERC commissioners and staff through, for example, embedding an advisor with extensive direct regulatory experience within NERC to advise on rule-making and due process for tariff setting. It is imperative that the leadership of the Commission be rejuvenated so as to ensure a timely restoration of investor confidence and the re-establishment of policy consistency and regulatory certainty in its activities and decision-making.

**Tariff Setting Methodologies.** A principal driver of the reforms in the industry was the need for cost-reflective tariffs. Prior to the reforms, electricity was considered a public welfare service to be provided by the government and was therefore heavily subsidized. A uniform pricing structure was used and tariffs remained fixed for years, despite rising energy costs.

The EPSRA (2005) describes the objectives of tariff regulations for the industry and places the setting and reviewing of electricity prices with NERC. The Multi Year Tariff Order (MYTO) is used to set wholesale and retail prices in the Nigerian Electricity Market, and is based on the following principles and assumptions:

- Cost recovery/financial viability
- Signals for investment
- Certainty and stability
- Efficient use of the network
- Allocation of risk
- Simplicity and cost-effectiveness
- Incentives for improving performance
- Transparency/fairness
- Flexibility/robustness
- Social and political objectives.

**Tariff Cost Reflectivity.** The new tariff structure (MYTO 2) was introduced in June 2012 with the intent to move to cost reflectivity based on actual costs. Due to the lack of historical data on costs, the original MYTO tariff structure was based largely on assumptions. For example, MYTO assumed that the targeted level of generation would be achieved, while the failure of FGN to implement policies that would result in an adequate amount of gas to fuel the new plants and the failure to invest in transmission infrastructure prevents this amount of power from being delivered to this day. A major assumption was the aggregate technical and commercial losses. Due to a continued lack of cost data, MYTO 2.1 was limited to revised assumptions. A large portion of the revenues expected from the sale of power have not been realized (commercial losses), yet prior to the elections in 2015, collection loss assumptions were arbitrarily removed for the permitted tariffs and revenues for DisCos based on a stated goal of requiring proof of the losses that could be not be avoided. However, after interventions by the new government, NERC is now entertaining submissions from the DisCos on a new set of tariffs for the DisCos.

## 2.4 POWER SECTOR DEVELOPMENT PLANS/INTEGRATED RESOURCE PLANS/GENERATION MASTER PLANS

Two of Nigeria's high-level, long-term energy sector planning documents have been recently updated by the Energy Commission of Nigeria (ECN): the Revised Renewable Energy Master Plan (2012) and the Revised National Energy Master Plan (2014). Short-term planning has been dominated by the Presidential Task Force on Power (PTFP) which prioritized and monitored specific projects related to generation, T&D, fuel pipelines, and market/sector reforms.[28] However the PTFP was always intended to be a temporary institution whose cessation was intended to occur with the successful privatization of the PHCN Successor Distribution and Generation Companies.

In recognition of the challenge surrounding a lack of a long-term power development plan, in September 2015 the Japanese International Cooperation Agency (JICA) announced the launch of a project to develop a Master Plan Study on National Power System Development, covering the 25-year period 2015- 2040. The plan is expected to include a power demand forecast, a least-cost development analysis and an optimal power generation master plan.[29] Although the plan's

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[28] "Power Reform Roadmap – 2014 Year in Review"; Presidential Task Force on Power; 2015

[29] "JICA to conduct a Comprehensive Power Sector Master Plan Study in Nigeria"; JICA; September 4, 2015; http://www.jica.go.jp/nigeria/english/office/topics/150904.html

development is still just beginning, it is not the intention of the Plan to cover the development of solar, wind, hydro or gas resources.[30]

The FGN's goal of 40,000 MW by 2020, as outlined by the 2010 Roadmap, would have required an unrealistic level of infrastructure development that the highly ambitious goal of 28,000 MW may be a more achievable target, with Nigeria relying on natural gas, hydro and potentially new coal fired power plants for generation over the next decade.

REMP assumes that the energy generation backbone will remain gas. While wind will play only a marginal role, solar power production is expected to outstrip all sources of electricity generation other than gas, and thus become the second key pillar of energy delivery in the nation. REMP sets out in the short, medium and long term what the national energy supply mix should be and articulates the strategic approach and measures to meet the targets. There is therefore a roadmap for implementing government's commitment to create the necessary enabling environment for sustainable energy supply for national development with active participation of the private sector. It is divided into different programs with targets, timelines and activities. Incentives to promote the attainment of the programs as well as generally grow the renewable energy market are also provided.

The current projection is that by 2025, 23% of the total electricity generated in Nigeria will have a renewable energy source. The FGN projects that Nigeria will generate 100 MW of small hydropower by 2015, which will increase to 2,000 MW by 2025; 300 MW of solar capacity by 2015, which will increase to 500 MW by 2025; 40 MW of wind power capacity by 2020; and 400 MW of biomass-fired capacity by 2025.

Nigeria has not even started the first grid scale renewable energy project. The 2015 targets are not going to be reached. It remains to be seen how Nigeria will achieve the 2025 targets. If there can be more private sector investors in renewable energy sources, those targets may be realistic.

The REMP does not specifically differentiate between on-grid and off-grid generation; however, it refers to integrating renewable energy into buildings, electricity grids and "other distribution systems." Despite policy stipulating targets, these targets have been continuously missed, indicating strategic and planning constraints. Indeed, one cannot help but conclude there has been a complete failure of institutional will to push the REMP forward.

The strategic objectives identified in REMP are broadly in line with those found in NEMP, such as work force capacity building, energy research and development and renewable energy data management.

The National Energy Master Plan sets broad short, medium and long-term priorities for all of Nigeria's energy sectors, such as petroleum, coal, nuclear, renewables, and energy efficiency, as well as covering energy themes, such as energy utilization, environment and climate change, and energy planning. Of particular interest to this review are sections on: energy planning and policy implementation, electricity, and renewable energy resources. The NEMP details the programs

[30] "Japanese firm unveils 25-year development plan for Nigeria's power sector"; Dennis Mernyi, Daily Sun; September 4, 2015; http://sunnewsonline.com/new/japanese-firm-unveils-25-year-development-plan-for-nigerias-power-sector/

required for each strategy enunciated in the National Energy Policy (NEP), together with associated execution, collaboration and funding agencies as well as associated timelines.

**Energy Planning and Policy Implementation.** Much of the Plan's focus on energy planning and implementation entails improving collaboration among government agencies and other stakeholders, managing and using energy sector data, the development of a new energy master plan and accelerated development of the energy sector workforce. Three activities stand out as potential areas for Power Africa Support:

- **Fast tracking the development of a National Energy Data Bank and generating energy data**. Energy data management and analysis is a highly technical capacity that is essential to informing the development of energy policy. Development of such capabilities will also support the monitoring of energy sector performance and implementation of the NEP. This task is expected to be carried out between the National Bureau of Statistics and the ECN, opening broad opportunities for technical assistance. Such assistance could come in the form of IT system design and procurement, implementation of the data collection process, and workforce capacity building.
- **Establishing State Energy Planning and Implementation Units**. Responsibility for energy planning, as envisaged in the NEMP, spans national, state and local government, as well as sector-specific actors. State-level planning and implementation units would take responsibility for parts of the planning process, especially as they relate to local governments. As a short-to-medium-term priority, these units must be established under the authority of the ECN and trained on their role within Nigeria's larger energy planning framework. Ample opportunities will exist for capacity building in energy-related technical fields, as well administration of energy policies.
- **Energy sector workforce development**. All areas of the energy sector require staff competent in a wide range of engineering and administrative roles. The NEMP cites the need for a comprehensive assessment and set of recommendations on the capacity building needs for the national energy workforce. Each of the activities listed above (an energy data base and state planning units) would require a capacity building component. It is likely that various types of capacity building are needed throughout the sector. Furthermore, the NEMP points to the need for preparation of energy curricula for secondary and tertiary educational institutions.

**Electricity - Rural Electrification.** The NEMP sets out a long list of activities targeting the electricity sector, including the need to fast track public and private investments in generation, transmission and distribution. The plan addresses rural electrification through five activities:

- Designing and implementing a long-term coordinated program for rural electrification based on distributed decentralized generation
- Ensuring effective administration of the Rural Electrification Fund
- Periodic review of regional/rural electricity policies
- Upgrading of existing rural power grids to meet the technical standards
- Exploring new and renewable energy sources to supply electricity to remote communities

These activities will take place over the short, medium and long-term, but are generally associated with establishing a transparent, systematic approach to off-grid electrification at the REA. The establishment of such an approach may have knock-on effects in other priority areas, such as increasing investor confidence in mini-grids, improving the viability of rural industry and expanding the market for renewable energy equipment. There are likely to be opportunities for technical assistance to the REA in realizing the development of a comprehensive rural electrification strategy, despite existing initiatives or donor programs.

**Renewable Energy.** The NEMP includes sections on: hydropower, solar, wind, hydrogen, and other, less prominent RE resources. As each of these resource types is currently at a different level of development in Nigeria, the types of activates prioritized under the plan diverge widely depending on the RE resource. However, in terms of the activities envisaged to incorporate donor support, three general categories can be highlighted:

- Developing local capacity for all levels of RE research, assessment, design, installation, and maintenance, including fostering local manufacturing of equipment.
- Raising awareness of renewable energy among the public, as well as organizing sector-targeted outreach, such as conferences and trade fairs.
- Developing data bases of renewable energy potential, including data gathering (e.g. meteorological stations for wind and hydro).

Considering the sections of the NEMP highlighted above, opportunities for technical assistance generally fall under workforce capacity building or the development of an energy data base. These two areas of assistance are enabling activities in that they support larger efforts to improve energy planning and plan implementation in the medium to long-term. However, it is clear that there is an immediate, short-term need to address these issues as well. Furthermore, capacity building and data management assistance may target several government agencies including the REA, ECM and NBS, allowing for greater flexibility in coordinating efforts with other donors or tailoring assistance to Power Africa priorities.

## 2.5 POWER GENERATION PROCUREMENT FRAMEWORK AND PROCESSES

NBET has responsibility for entering into contracts with new power generators. Currently NBET is negotiating directly with unsolicited bidders who previously had been given licenses by NERC. In the future, it will be responsible for running competitive tenders for new generation capacity.

On February 11, 2014, NERC published Regulations for the Procurement of Generation Capacity, 2014, which outline the processes to be followed by a buyer in procuring additional electric generation capacity. The regulations apply to the purchase of any generation capacity that is intended to be connected to the grid or, as an embedded generator, generating capacity that is connected to a distribution network. In other words, the regulations seem to exclude the off-grid IPPs in their application. The regulations specifically state that unsolicited bids for additional generation capacity shall not be considered by buyers.

The procedures include the procurement process (expression of interest followed by a request for proposals), criteria of bidders and their qualification, requirements for requests for proposals, the bidding process and the implementation of contracts, including the PPA.

It is important to note that the Regulations for the Procurement of Generation Capacity generally leave a wide discretion to NERC to make decisions with respect to the procurement process.

## 2.6 ELECTRIFICATION TARGETS, PLANNING AND EXECUTION (FOR GRID AND OFF-GRID)

Nigeria's national electrification rate at 45%, leaves almost 93 million people without electricity.[31] The lack of access to electricity is exacerbated by the large tracts of rural areas that are too remote to have access to the grid, making the rural electrification rate (35%) substantially less than the urban electrification rate (55%).

Table 4 below summarizes the current state of Nigeria's electrification rate. The FGN has a target of 75% of the population (rural or urban) to be electrified by 2020 and universal coverage by 2030.[32] To date, electrification targets have not been met.[33]

**TABLE 4: ELECTRICITY ACCESS LEVELS IN NIGERIA**

| Year | Access Indicator | % of Population |
|---|---|---|
| 2012 (historic) | Overall access: | 45% |
| | Urban access: | 55% |
| | Rural access: | 35% |
| 2022 (target) | Overall access: | 75% |
| 2030 (target) | Overall access: | 100% |

Source: Africa Energy Outlook, 2014.

One of the biggest hurdles to achieving the electrification targets remains transmission and distribution infrastructure investment. In terms of increasing the transmission infrastructure, the Presidential Action Committee on Power has prepared a Transmission Expansion Blueprint, which essentially requires the federal government to expand the transmission capacity in Nigeria to carry 16,000 MW.

Nigeria's approach to rural electrification is guided by a series of policies including the National Electric Power Policy (NEPP) 2001, the NEP 2003 and the Rural Electrification Policy 2009. This approach is consolidated in the Rural Electrification Strategy and Implementation Plan (RESIP) 2006, which was updated in 2014.

The revised RESIP 2014 reaffirms the central role of the REA in driving and implementing Nigeria's rural electrification policy. However, the REA does not have the resources needed for the massive investment needed for such implementation. One of the REA's primary responsibilities is the management of the Rural Electrification Fund (REF), a fund set up to help subsidize capital expenditures for rural electrification projects. The REF, financed by fines to NERC and international donors, is the core of Nigeria's rural electrification effort.

The RESIP outlines the major goals and targets of Nigeria's rural electrification policy, and prescribes certain approaches to its implementation in terms of stakeholder coordination and capacity building, as well as encouraging the use of PPPs for establishing rural electrification projects. RESIP's overarching objective is to "promote a centrally coordinated but decentralized demand-driven approach, that is, a market oriented approach to rural electrification".

[31] The World Bank World Development Indicators list the access to electricity as 55.6% of the total population.

[32] (Africa Energy Outlook, 2014; National Energy Policy, 2003)

[33] (Prof. Eberhard, 2015)

In defining the challenges obstructing these high-level electrification goals, the RESIP highlights a number of key barriers and challenges organized into six categories:

- Central Planning and Coordination – potential for overlap of off-grid and grid extension projects.
- Demand for off-grid power – low energy demand of new rural connections; the need to accommodate different cost-reflective tariffs based on system size, technology and other site-specific factors; establishment of a fair subsidy mechanism via the REF allowing the REA to minimize differences in site-specific tariffs.
- Supply of off-grid power – lack of developer interest in off-grid systems and lack of access to incentives.
- Renewable Energy Economics – efficient application of REF capital cost subsidies; projects receiving subsidies must assess O&M costs in financial analyses and business plans; evaluating projects against grid extension alternatives.
- Financing – lack of low-cost credit facilities (e.g. NGOs, partnership banks); facilitating a Private Equity Fund for long term investments.
- Technical Capacity – lack of human resources capacity for off-grid renewable energy development.

# 3 NIGERIA'S POLICIES AND LAWS FROM A GENDER EQUALITY AND FEMALE EMPOWERMENT PERSPECTIVE

A comprehensive gender analysis of the energy-related legal and policy framework in Nigeria is beyond the scope of this section. A few selected provisions from key policies are highlighted and some gaps are noted that may be relevant for Power Africa when planning interventions concerning legal and policy reform.

Nigeria has a National Gender Policy (2006) premised on the following key principles:

- Commitment to gender mainstreaming as a development approach
- Recognition of gender issues as central to the achievement of national development goals, and a requirement for all policies to be reviewed accordingly
- A cooperative interaction of all stakeholders
- Promotion and protection of human rights, social justice, and equity
- Gender equality as a cross-cutting issue.

The policy has a number of objectives and corresponding targets towards advancing gender equality in Nigeria. The policy requires a multi-sectorial approach from all spheres of government and should inform all national laws and policies, including those relating to energy.

The National Energy Policy (NEP) (2003) is silent on gender issues. Possibly attributable, in part, to the National Gender Policy, the Draft Revised NEP (2013), which is currently under consideration, strengthens the current policy by including a section on gender issues. The policy provides for gender mainstreaming in energy issues and includes short-term strategies, to achieve the following objectives: to create awareness on gender issues in the energy sector, and to provide a better basis for incorporating gender in energy project design and implementation at the micro- and macro-policy levels. Strategies include the establishment of gender units in all ministries, departments and agencies; gender-sensitive capacity building programs; conducting gender audits of national energy and other related policies; and developing reliable gender responsive statistical data. The strategies are to be reviewed, improved and continued in the medium and long terms.

The National Energy Master Plan (NEMP) (2014) includes an action plan for gender issues. For each strategy in the Draft Revised NEP, activities are presented with an indication of the corresponding implementing agency and collaborating agencies. Funding sources are also noted along with a timeline. Adequate financial resources and sufficient capacity, particularly with respect to understanding the process of gender mainstreaming, are required to effectively implement the action plan.

The Draft Revised NEP includes a section on manpower development and training. The NEMP includes a corresponding action plan. The use of the term "manpower" is an indication of gender blindness in this section whereas, gender-neutral language such as human capacity would be more accurate. One gap in the 2013 NEP and NEMP is the failure to consider the specific capacity development needs of women in the energy sector in the section dedicated to development and training, and to include measures to increase women's capacity towards more equal participation in the sector.

The Energy Power Sector Reform Act No. 6 of 2005 establishes the Nigerian Regulatory Commission and the Rural Electrification Agency (REA). The relevant sections of the Act do not provide specifically for women's participation in either of these important decision-making bodies. Without a specific policy directive for women's representation in the Commission and REA, women may be excluded or insufficiently represented.

# 4 DONOR ASSISTANCE TO NIGERIA

The US Embassy to Nigeria characterized overall donor engagement in the power sector as intensive. The most active donors in the power sector listed were the World Bank, African Development Bank, Germany, UK, UN, and Japan.

**European Union (EU) and EU Member States:** An example of the EU's involvement in the energy sector is the Energizing Access to Sustainable Energy (EASE) project, which supports renewable energy, energy efficiency and rural electrification through the Nigerian Energy Support Program (NESP) (also funded by the German Government and implemented by the German Agency for International Cooperation - GIZ). EASE also addresses massive deforestation and access to clean cook stoves in Katsina State, and gas flaring reduction in the South. Other European countries involved in the power sector are the United Kingdom (UK) through its Department for International Development (DfID), which established the Nigerian Infrastructure Advisory Facility (NIAF) implemented by Adam Smith International, which works on power sector reform and the provision of access to clean technologies such as off-grid renewable energy systems and improved cook stoves. France, through the Agence Française de Développement (AFD) and PROPARCO works on access to finance for renewable energies, training for the power sector staff and support to the TCN. Sweden and Norway have also participated in power sector reform.

**World Bank and other international financial institutions:** The World Bank is one of the biggest and longest lasting players in Nigeria's energy sector. It is strongly involved in the power sector reform and supports the construction of new generation and distribution via on-grid and off-grid conventional (including gas flaring reduction) and renewable energies. It is also supporting the FGN and DisCos with planning. Associated development finance institutions such as the International Bank for Reconstruction and Development, the African Development Bank (AfDB) and the International Finance Corporation (IFC), are also involved in power sector reform.

**United States Agency for International Development (USAID):** USAID currently implements several projects in Nigeria covering such aspects as renewable energy (large-scale and decentralized) and conventional energy sources through, for example, the Power Africa Initiative and the Nigeria Energy and Climate Change initiative. Financing provided under this program will be in the way of financial support and loan guarantees. It also covers finance for the private sector and skills development through the Renewable Energy and Energy Efficiency Project, implemented by Winrock International.

**Japan International Cooperation Agency (JICA):** JICA has played an important role in the development of hydrological master plans, including the identification of possible hydropower sites. It has also developed a solar energy master plan and has supported the development of renewable energy infrastructure in the country.

**United Nations (UN):** The UN has provided major funding and hired a contractor for small-scale renewable energy (solar home systems and clean cook stoves) projects through its various agencies. The UN Industrial Development Organization (UNIDO) is strongly involved in small hydropower development with the establishment of the Regional Center for Small Hydro Power and support for the development of several small hydropower projects.

# 5 RECOMMENDED POLICY INTERVENTIONS FOR INCREASING INVESTMENT AND ACCESS

## 5.1 ENERGY POLICIES

There is a discontinuity between the objectives and strategies outlined in Nigerian energy policies and their implementation. Assistance in the formulation of effective strategies to implement the policy framework would be a key step in allowing the energy sector to meet national development goals.

High priority policy interventions that would enable private investment to achieve the desired levels of energy access would include:

- Enhancement of the power sector Blueprint supported by an implementation plan,
- Development of a coherent and appropriate Renewable Energy Policy and implementation plan, drawing on international best practice. In addition, develop capacity to make resource estimations, manage data, conduct analysis and build sustainable institutional capacity for renewable energy development.
- Address the bureaucratic barriers that are impeding the finalization of rural electrification and energy efficiency policies so that amongst others, small solar PV installations, mini or small hydropower plants and larger hybrid systems can be pursued as options to provide electricity to rural communities. Even small decentralized biogas projects offer potential.
- Development of a coherent implementation plan for reform of the transmission sector that also addresses all current ownership, management, funding, transactional and institutional challenges at TCN.
- Re-establishment of NERC as an independent regulator that can be trusted to approve cost reflective tariffs.
- An end to the use of a capacity component in the residential tariff structure which has completely undercut the credibility of the energy reform process by requiring that bills be sent to people who cannot receive power from the grid.

## 5.2 ENERGY LAWS/REGULATIONS

The Regulation on National Content Development for the Power Sector of 2014, which provides for a strong preference for locally sourced equipment and services, would create a major barrier to foreign investment in the power sector. It is recommended that NERC be advised of the impact and urged to reconsider imposition of the regulation at this time. The legality of the Regulation under Nigeria’s treaty obligations should be referred to legal counsel for resolution before any attempts are made to implement this regulation.

## 5.3 ENERGY REGULATORY FRAMEWORK AND TARIFFS

There is general consensus that the adjustments to the MYTO 2.1 loss assumptions and the impact on DisCo tariffs seriously threaten the financial sustainability of the sector. These are currently being reviewed. In order to bolster the financial sustainability of the power sector, NERC needs to ensure that tariffs are increased to cost reflective levels and in addition, NERC needs to develop a workable model for IPP cost recovery.

## 5.4 POWER SECTOR DEVELOPMENT PLANS/INTEGRATED RESOURCE PLANS/GENERATION MASTER PLANS

A critical shortcoming of the Nigerian energy sector has been its inability to effectively plan for new generation capacity, and consequently procure new capacity timeously. The Roadmap, 2010 was very limited in terms of renewable energy, energy efficiency and rural electrification development. Its core focus was on other forms of energy delivery systems and it did not address demand projections or how the electricity demand was to be met. To address these planning constraints, consideration should be given to development of an Integrated Resource Plan to determine the long-term electricity demand and detail how this demand should be met in terms of generation capacity; type; timing and cost; conducting integrated demand modelling and development of a price path. Building institutional capacity for effective generation planning going forward is also critical.

## 5.5 POWER GENERATION PROCUREMENT FRAMEWORK AND PROCESSES

While NERC has published regulations on competitive procurement, NBET has yet to run competitive tenders for new power generation capacity. Instead, it has entered into direct negotiations with IPP developers who have previously obtained licences from NERC. NBET probably has the capacity to fully evaluate the cost-effectiveness of these unsolicited bids, but should begin efforts to move to competitive tenders to realize additional cost savings, initially for renewable energy IPPs. RFP documentation and standard PPAs were developed two years ago for gas procurement, and a renewable PPA has been developed for solar power. Support should be provided to conclude this work.

## 5.6 ELECTRIFICATION TARGETS, PLANNING AND EXECUTION (FOR GRID AND OFF-GRID)

There are a limited number of private participants willing to invest in off-grid electrification. With lessening surety in terms of defined policy and regulation, these private participants are even rarer in the renewable energy and rural electrification sectors which is the fastest means for electrification of areas not typically connected to the grid. In light of the key impediments to off-grid electrification namely (i) lack of central planning and co-ordination (ii) low energy demand for rural connections (iii) lack of incentives and developer interest in off-grid (iv) lack of application of REF subsidies (v) lack of financing options (vi) lack of technical capacity, it is recommended that support be given to both developers and REA.

REA should be assisted in establishing an approach to cost-reflective tariffs and a transparent subsidy regime that minimizes differences in off-grid tariff levels together with coordination with financial institutions to reduce financing costs for approved projects.[34]

Assistance to developers takes the form of:

- accessing donor finance
- preparing proper mini-grid business plans (including concession, dealership and leasing arrangement models), billing mechanisms, navigating REF applications, licensing, etc.
- finding qualified personnel.

Once policy and an investor-friendly regulatory framework are in place, and once it becomes clear which application track is required for accessing subsidies for capital costs, project developers may find that there is latitude for engagement and the subsequent increase of off-grid electrification would result.

[34] The Rural Electrification Agency (REA) is still awaiting the approval of the RESIP. Operationalization of the REF is important as a coherent planning and regulatory framework in order to promote investments and streamline the actions of federal, state and private actors towards a mass roll-out of electrification projects across the country.

# 6 RECOMMENDED TECHNICAL ASSISTANCE FOR INCREASING INVESTMENT AND ACCESS

Table 5 details the suggested technical assistance for implementing the policy interventions identified in Section 5.

**TABLE 5: RECOMMENDED TECHNICAL ASSISTANCE**
**To Enable or Increase Private Sector Investment in Cleaner Power Generation and Widened Access to Electricity**

| Policy Intervention | Technical Assistance | Active Donors in this Space | Donor(s) Recommended to Provide Support |
|---|---|---|---|
| Further enhancement of the Blueprint for Power Sector Reform supported by an implementation plan | Assist FGN with enhancement of the power sector Blueprint drawing on the previous Power Sector Reform Roadmap of 2010 | World Bank | USAID |
| Development of a renewable energy policy and implementation plan | Assist FGN with the development of a renewable energy policy and implementation plan | GIZ is providing major funding for this effort | USAID |
| Review and finalization of off grid rural electrification and energy efficiency policies for implementation | Review and make recommendations on the current draft rural electrification and energy efficiency policies so that they are finalized for implementation | None that we are aware of | USAID |
| Development of a coherent implementation plan for reform of the transmission sector that also addresses all current ownership, management, funding, transactional and institutional challenges at TCN. | Assistance with development of a coherent implementation plan for reform of the Transmission sector including a succession plan for TCN post the MHI contract and the possibility of a further private management contract or concession | USAID, through Power Africa<br><br>World Bank | USAID |
| Development of the business case for private sector investment in new transmission assets | Assistance with identifying and prioritizing opportunities for transmission PPPs based on the concession model and development of the business case for government approvals and further regulatory action | World Bank<br>USAID, through Power Africa | World Bank, USAID, DFID |

| TABLE 5: RECOMMENDED TECHNICAL ASSISTANCE<br>To Enable or Increase Private Sector Investment in Cleaner Power Generation and Widened Access to Electricity | | | |
|---|---|---|---|
| Policy Intervention | Technical Assistance | Active Donors in this Space | Donor(s) Recommended to Provide Support |
| Convince NERC not to implement the Regulation on National Content | Inform NERC of the adverse impacts of implementing this Regulation, evaluate the apparent conflict with commitments under international treaties | USAID, through Power Africa assisting with some aspects | USAID |
| Development of capacity in NERC to achieve transparent, credible and predictable determinations of cost reflective tariffs for the distribution and transmission sectors | Assist NERC (and new Commissioners) to develop capacity to implement transparent, credible and predictable tariffs that are cost reflective and support the financial sustainability of the sector | None that we are aware of | USAID |
| Development of an Integrated Resource Plan (IRP), and ongoing planning capacity that will facilitate the procurement of new generation capacity | Assist in the formulation of an IRP, integrated demand modeling, least-cost supply options, and the development of a price path<br><br>Development of capacity to undertake frequent updates of the IRP | GIZ and World Bank have related projects | USAID |
| Development and implementation of a competitive procurement framework for clean energy | Support current efforts at NBET to design a competitive power procurement framework and supporting RFP package including standardized PPA and other commercial contracts for implementation<br><br>Support efforts by other donors to evaluate the grid for opportunities to integrate renewables into the grid | GIZ and World Bank have related projects | USAID |
| Development of modeling and planning capacity in the REA and assistance in the operationalization of the REF | Assistance with modeling and planning capacity in the REA and assistance in the operationalization of the REF<br><br>Assistance to developers on modeling, planning and capacity in order to access donor finance and find qualified personnel | None that we are aware of | USAID |

| TABLE 5: RECOMMENDED TECHNICAL ASSISTANCE<br>To Enable or Increase Private Sector Investment in Cleaner Power Generation and Widened Access to Electricity | | | |
|---|---|---|---|
| Policy Intervention | Technical Assistance | Active Donors in this Space | Donor(s) Recommended to Provide Support |
| Build capacity in gender mainstreaming, promote women's participation in training and development activities as well as on the Regulatory Commission and REA<br><br>Develop awareness of the benefits of women's participation in the general workforce | Gender mainstreaming workshop and resources, and promotion of women in the sector through Power Africa's Women in African Power Network | None that we are aware of | USAID |

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# APPENDIX A: RECOMMENDED POLICY INTERVENTIONS FOR TRANSACTIONS

This appendix summarizes the key policy and regulatory impediments to bringing projects to financial close in Nigeria. It then recommends policy, legal, regulatory, operational and other interventions to address them, and the technical assistance that is being provided/is needed to implement the recommendations.

## A.1 GENERATION PROJECTS

**TABLE 6: RECOMMENDED POLICY INTERVENTIONS BASED ON CURRENT TRANSACTIONS**
**Generation Projects**

| Policy and Regulatory Barriers to Transaction(s) | Recommended Intervention(s) and Effects | Technical Assistance Provided/Needed |
|---|---|---|
| 1. National Content for Development for the Power Sector<br>In December 2014 the NERC issued The Regulations on National Content Development for the Power Sector 2014. Although not yet effective, these regulations could establish a strong preference for local sourcing of equipment and services applicable to NERC licensees in generation, transmission and distribution. Licensees would also have an obligation to maintain a technology transfer plan with details of the technologies used by the operator and proposed methods of transfer to Nigerians.<br><br>These regulations would create a major barrier to foreign investment in the electric energy sector.<br><br>2. Foreign Currency Exchange Risk<br>All payments for the purchase of electricity are made in local currency. Attracting foreign investment to Nigeria requires a practical method or converting Naira to USD for use in repaying hard currency debt and a return on hard currency equity investment without currency exchange risks. Nigeria no longer has a practical means of doing so. | Provide information to NERC directly and through NBET regarding the negative impact of national content requirements.<br><br>Work with financial advisors to develop a workable approach to currency exchange issues.<br><br>Work with NBET to propose to NERC the implementation of variable transmission loss factors for renewable energy projects, pending the point of when the TCN system is prepared to change for all generators.<br><br>Work with NBET to propose to NERC regional variation in rates for renewable energy. | Provide technical assistance to the Nigeria Bulk Electricity Trading Company (NBET) in drafting standard form PPAs and other key project agreements for the projects identified by NBET.<br><br>Intervention should expand to policy support. |

| TABLE 6: RECOMMENDED POLICY INTERVENTIONS BASED ON CURRENT TRANSACTIONS<br>Generation Projects | | |
|---|---|---|
| Policy and Regulatory Barriers to Transaction(s) | Recommended Intervention(s) and Effects | Technical Assistance Provided/Needed |
| 3. Nigerian Electricity Regulatory Commission Transmission Loss Factor Requirement.<br>NERC has yet to implement location-based loss factors despite its stated intention to do so through a marginal loss factor regime. The grid-wide 8.05% loss factor imposed on generators does not provide the correct price signals for the location of generation. This problem is most acute with respect to generation proposed to be located away from generation sources and closer to load, where the loss factor may be negative.<br><br>4. Regional variations of renewable energy sources.<br>To date, there is no policy to allow for regional variations of renewable energy sources to be factored into the determination of the electricity tariff. Differences in the need for and cost of renewable energy are unusually significant in Nigeria. | | |
| There are no creditworthy offtakers in Nigeria, except certain retail industrial/commercial customers.<br><br>Work to date has established NBET as a *credible* offtaker, as opposed to a creditworthy offtaker, and the current structure should work for the intermediate term, provided key elements of the structure are maintained and NBET reserves are not used as a source of cash for other purposes. | Continue to assist NBET with specific strategic advice on credit enhancement mechanisms, as required. | Provide capacity building and training to NBET to help build expertise in credit enhancement, balancing of revenues and costs, procurement of PPAs and due diligence, including put call option agreements and World Bank PRGs.<br><br>Additional interventions will relate to the realization of revenues from DisCos and FGN market intervention. |

| **TABLE 6: RECOMMENDED POLICY INTERVENTIONS BASED ON CURRENT TRANSACTIONS**<br>**Generation Projects** | | |
|---|---|---|
| Policy and Regulatory Barriers to Transaction(s) | Recommended Intervention(s) and Effects | Technical Assistance Provided/Needed |
| Challenges relating to grid interconnection and transmission.<br><br>Difficulties in completing the grid interconnection process at TCN.<br><br>Difficulties in securing gas for gas-powered plants. | Development of a mechanism to identify preferred locations in conjunction with TCN, and prioritizing projects.<br><br>Initiative to identify barriers to using new gas supplies, with an initial focus on projects located near private gas suppliers, but including outreach to IOCs. | Development of a mechanism to identify preferred locations in conjunction with TCN.<br><br>For gas, discuss gas supply issues with developers, and potential gas suppliers with known credible projects to identify the issues and propose solutions.<br><br>Discuss gas supply issues with IOCs to get their perspective as to what is needed to step up the production of gas. |
| Developers are not fully aware of the complex FGN requirements for procurement.<br>The FGN has clearly stated its preference for competitive procurements; however, there are institutional impediments for a competitive procurement. | Support efforts for coordinated action by FGN agencies.<br><br>Identify and resolve barriers to competitive procurement. | Continue to provide technical support on negotiated procurements coupled with capacity building. Assist in preparing standard forms for commercial agreements, due diligence efforts and negotiations. Help identify various Nigeria-unique issues to the various project developers. These efforts will continue.<br>Assist NBET is seeking FGN agency coordination. |
| FGN agencies have established a complex set of requirements, some of which are not transparent.<br><br>FGN agencies are very slow to process applications. | Establish a process for coordination of FGN agency action on priority projects.<br><br>Assist in the identification of priority projects. | Assist NBET in identifying merit-based criteria for prioritizing projects.<br><br>Assist NBET in establishing inter-agency coordination. |
| FGN has not promoted renewable energy through mechanisms common in other countries. | Identify mechanisms for promoting clean energy and implementing these. | Assist NBET by identifying the values of renewable energy and encourage it to forge a consensus for promotion through programs reflecting best practices internationally. |

| TABLE 6: RECOMMENDED POLICY INTERVENTIONS BASED ON CURRENT TRANSACTIONS<br>Generation Projects | | |
|---|---|---|
| Policy and Regulatory Barriers to Transaction(s) | Recommended Intervention(s) and Effects | Technical Assistance Provided/Needed |
| Desperate shortages exist on the grid, preventing the grid from serving those who can be connected.<br><br>A huge number of rural areas are too remote to have access to the grid. | Support increases in power available to the grid by eliminating barriers such as fuel shortages.<br><br>Support grid rebuild and expansion through TCN. | In additional to the procurement support provided to date, actively intervene to identify and solve barriers to deals moving forward.<br><br>Grid support will be through TCN, but NBET can monitor and support these efforts. |
| Women are reasonably well represented in NBET, but improvement is possible. | Continue to encourage the hiring, training and promotion of women within NBET.<br><br>Support initiatives aimed at providing access to electricity to women throughout Nigeria. | The benefits of including women have been stressed to NBET with positive results and will be continued.<br><br>Initiatives to provide women with access to electricity would be expanded from grid power to assisting BTG initiatives. |

## A.2 IPP RENEWABLE ENERGY GENERATION TRANSACTIONS

| TABLE 7: RECOMMENDED POLICY INTERVENTIONS BASED ON CURRENT TRANSACTIONS<br>IPP Renewable Energy Generation Transactions | | |
|---|---|---|
| Policy and Regulatory Barriers to Transaction(s) | Recommended Intervention(s) and Effects | Technical Assistance Provided/Needed |
| As noted under generation. | Assist in developing a recognition of the benefits of renewable energy and in evaluating renewable energy tariff structures. | Provide support in evaluating tariff proposals, including benchmarking and adjustments for Nigeria conditions. |
| As noted under generation. | As noted under generation. | As noted under generation.<br><br>Support the evaluation of tariff proposals, including benchmarking and adjustments for Nigeria conditions. |
| Some projects require expensive transmission connections due to the location required for the renewable energy technology. | Develop a means to address the enhanced costs of renewable energy connection to the grid. | Develop a means to address the enhanced costs of renewable energy connection to the grid. |

| TABLE 7: RECOMMENDED POLICY INTERVENTIONS BASED ON CURRENT TRANSACTIONS<br>IPP Renewable Energy Generation Transactions | | |
|---|---|---|
| Policy and Regulatory Barriers to Transaction(s) | Recommended Intervention(s) and Effects | Technical Assistance Provided/Needed |
| Renewable energy remains more costly in Nigeria in large part due to a failure to deploy these technologies widely. | Encourage expedited deployment of lead projects. | Encourage expedited deployment of lead projects. |
| The status of renewable energy projects in the FGN procurement process has not been addressed. | Establish a renewable energy priority across FGN agencies with specific incentives. | Establish a renewable energy priority across FGN agencies with specific incentives. |
| As noted under generation. | As noted under generation. | As noted under generation. |
| There are no clear incentives for renewable energy in Nigeria. | Establish a renewable energy priority across FGN agencies with specific incentives. | Establish a renewable energy priority across FGN agencies with specific incentives. |
| As noted under generation.<br><br>It should be noted that women are more commonly involved in renewable energy projects than in thermal projects | As noted under generation. | As noted under generation. |

## A.3 FACILITATE GAS-TO-POWER GENERATION TRANSACTIONS

| TABLE 8: RECOMMENDED POLICY INTERVENTIONS BASED ON CURRENT TRANSACTIONS<br>Facilitate Gas-to-Power Generation Transactions | | |
|---|---|---|
| Policy and Regulatory Barriers to Transaction(s) | Recommended Intervention(s) and Effects | Technical Assistance Provided/Needed |
| Each project is struggling with delays caused by FGN actions in 1-2Q 2015 that halted construction/development.<br><br>Details of development need to be resolved. | Assist NBET and developers to overcome the remaining impediments. | Assist NBET and developers to overcome the remaining impediments. |

## A.4 GAS-TO-POWER GENERATION INITIATIVE

**TABLE 9: RECOMMENDED POLICY INTERVENTIONS BASED ON CURRENT TRANSACTIONS**
**Gas-to-Power Generation Initiative**

| Policy and Regulatory Barriers to Transaction(s) | Recommended Intervention(s) and Effects | Technical Assistance Provided/Needed |
|---|---|---|
| Issues relating to control after the transfer of joint venture concessions may inhibit the development of gas.<br><br>Owners of transferred concessions may be unwilling to develop gas on a timely basis.<br><br>The managing IOCs of the joint ventures with NNPC have not have not been developing new gas supplies. | Reach out to companies in the gas-to-power chain to understand issues that are delaying the development of new gas supplies.<br><br>The result will be actionable reports as to how to resolve the issues for as many projects as feasible. | Identification of real world issues and potential solutions.<br><br>Resolve problems for specific projects.<br><br>Prepare a report on barriers IOCs perceive to active gas development for intervention by the USG to seek a resolution. |
| Securing new gas supplies is a critical impediment to increasing gas generation. | Determine the real issues and propose solutions. | Determine the real issues and propose solutions. |

## A.5 FGN-FUNDED TRANSMISSION PROJECT TRANSACTIONS

**TABLE 10: RECOMMENDED POLICY INTERVENTIONS BASED ON CURRENT TRANSACTIONS**
**FGN-Funded Transmission Project Transactions**

| Policy and Regulatory Barriers to Transaction(s) | Recommended Intervention(s) and Effects | Technical Assistance Provided/Needed |
|---|---|---|
| NERC often does not apply best practices in regulating the transmission sector.<br><br>NERC commissioners are poorly qualified and lack adequate training<br><br>The current structure of NERC, with Commissioners heading operating divisions, does not provide adequate independence for technical staff and | Improve regulation of the transmission sector. | Provide capacity building to NERC commissioners and staff.<br><br>Embed a USAID advisor with extensive direct regulatory experience within NERC to advise on rule-making and due process for tariff setting, among others. |

| TABLE 10: RECOMMENDED POLICY INTERVENTIONS BASED ON CURRENT TRANSACTIONS<br>FGN-Funded Transmission Project Transactions | | |
|---|---|---|
| Policy and Regulatory Barriers to Transaction(s) | Recommended Intervention(s) and Effects | Technical Assistance Provided/Needed |
| distorts the role of Commissioners who should focus on rulemaking | | Develop a restructuring plan for NERC addressing proper roles and responsibilities for Commissioners and staff |
| TCN faces a lack of funding to complete ongoing projects, let alone start new ones.<br><br>Too much of TCN's funding is tied up with political projects, i.e., unfunded earmarks. | Encourage better financial planning and inter-governmental coordination of funding.<br><br>Encourage better integration between project/contract managers and the finance and accounting functions.<br><br>Eliminate unfunded political earmarks. | Help TCN with financial planning and budgets.<br><br>Troubleshoot company financial operations and inter-departmental coordination.<br><br>Help with outreach with FMoF, MOP and donors |
| Transmission use-of-system (TUOS) charge is not cost reflective.<br><br>Volume-based tariff design is unwarranted and results in a high degree of revenue unpredictability; TUOS tariff should be structured as a fixed charge. | Increase tariffs to cost-reflective levels and restructure TUOS tariff as a fixed charge. | Provide transmission revenue requirements study.<br><br>Help TCN with its tariff submissions to NERC.<br><br>Advise TCN management in the tariff proceeding.<br><br>Provide capacity building to NERC on best practices for tariff setting.<br><br>Assist NERC in conducting rate cases using best practices.<br><br>Evaluate need to reorganize NERC to improve performance |
| TCN needs to improve its capacity to carry out core functions | Targeted capacity building<br>Employee empowerment and regional autonomy initiatives. | Assist with prioritizing projects and conducting procurements.<br><br>Assist with managing finances and accounts. |

| TABLE 10: RECOMMENDED POLICY INTERVENTIONS BASED ON CURRENT TRANSACTIONS<br>FGN-Funded Transmission Project Transactions | | |
|---|---|---|
| Policy and Regulatory Barriers to Transaction(s) | Recommended Intervention(s) and Effects | Technical Assistance Provided/Needed |
| | Beef up resources provided under the MHI management contract.<br><br>Improve job skills in core functions. | Assist with project/contract management.<br><br>Provide capacity building for TCN management staff.<br><br>Assist with prioritizing and scoping projects, and mapping projects to available funding.<br><br>Develop project appraisal reports for new loans, e.g., China EximBank.<br><br>Provide support for human resources (HR) aspects of employee empowerment and regional autonomy initiatives. |
| Need to improve transparency and accountability in conducting transmission project procurement.<br><br>Project engineers that are not well trained double as procurement experts.<br><br>Lack of capacity to properly identify, prioritize and scope new project requirements.<br><br>Need to set boundaries for MoP's role in major project procurements and negotiations with contractors for MOUs. | Consolidate all TCN procurements under the World Bank Project Management Unit (PMU) in Abuja.<br><br>Retain a qualified international owner's engineer based in HQ to supervise procurements and manage EPC contractors.<br><br>Train transmission engineers on procurement procedures and EPC contracting.<br><br>Take legislative and/or regulatory action to set limits on MOP role in procurements/MOUs. | Provide procurement documents based on best international practices.<br><br>Assist TCN to implement procurements, including project scoping, bidder prequalification and bidding.<br><br>Provide capacity building on EPC contracting. |

| TABLE 10: RECOMMENDED POLICY INTERVENTIONS BASED ON CURRENT TRANSACTIONS<br>FGN-Funded Transmission Project Transactions | | |
|---|---|---|
| Policy and Regulatory Barriers to Transaction(s) | Recommended Intervention(s) and Effects | Technical Assistance Provided/Needed |
| Transmission projects are started without having 100% of the funding in hand.<br><br>Too much external interference in deciding which projects go forward.<br><br>An optimal expansion plan for the next set of needed projects already exists, but there is no consensus on project phasing in light of financial constraints. | Take legislative and/or regulatory action to limit external influence by elected officials and ministries on deciding which projects move forward and when.<br><br>Improve transmission project phasing.<br><br>Improve monitoring of projects already underway and dynamic response to synchronize completion of inter-related projects in light of delays.<br><br>Improve coordination between procurement and finance to integrate financial plan with system expansion plan. | Aside from an ongoing USD 2 million transmission planning study being financed by the World Bank, TCN's more immediate need is for assistance planning and managing the ongoing and near-term capital projects.<br><br>Help troubleshoot project and contract management issues; advise on organization and communication issues; develop new company procedures.<br><br>Help TCN develop cash-constrained capital plan.<br><br>Capacity building for project/contract management.<br><br>Assist system operator to produce an annual system plan, as called for in Market Rules. |
| Ad hoc practices for funding right-of-way resettlement and obtaining new right-of-ways result in project delays.<br><br>Lack of capacity, particularly in the field divisions, for proper identification and scoping of projects.<br><br>Issues with implementation of the Land Use Decree/Act | Improve processes for funding resettlement and managing the procurement of right-of-ways.<br><br>Improve capacity to manage the real estate functions of TCN.<br><br>Acquisition and funding for right-of-ways should be devolved to states and local governments, which are best suited to handle such grassroots issues. | Troubleshoot TCN procedures and policies for obtaining and funding<br><br>Provide capacity building on negotiating for new rights of way, managing real estate and EIAs.<br><br>Troubleshoot issues with Land Use Decree/Act.<br><br>Continue to assist TCN with prioritizing projects and planning phased procurements. |
| Some remote renewable energy projects present challenges for grid interconnection. | Streamline the grid interconnection process for generation developers. | Assist TCN with organization, staffing, roles/responsibilities and procedures to provide |

| TABLE 10: RECOMMENDED POLICY INTERVENTIONS BASED ON CURRENT TRANSACTIONS<br>**FGN-Funded Transmission Project Transactions** | | |
|---|---|---|
| Policy and Regulatory Barriers to Transaction(s) | Recommended Intervention(s) and Effects | Technical Assistance Provided/Needed |
| Renewables developers find it difficult to navigate the grid interconnection process at TCN.<br><br>There is no capital funding available to TCN for grid interconnection projects. | Address capital funding constraints for grid inter-connection projects | improved grid inter-connection services to generation developers.<br><br>If advisable, work with NBET and NERC to transfer cost responsibility for grid interconnection projects from TCN to NBET.<br><br>Troubleshoot interconnection negotiation issues, e.g., payment for interconnection costs for equipment transferred to TCN. |
| Aside from a few small pockets of TCN, notably the Legal Department, women are under-represented. | Government needs to better promote women in engineering | Advise TCN's HR Department on best practices for gender equality and female empowerment.<br><br>Provide related capacity building. |

## A.6 FACILITATE TRANSMISSION PPP TRANSACTIONS

| TABLE 11: RECOMMENDED POLICY INTERVENTIONS BASED ON CURRENT TRANSACTIONS<br>**Facilitate Transmission PPP Transactions** | | |
|---|---|---|
| Policy and Regulatory Barriers to Transaction(s) | Recommended Intervention(s) and Effects | Technical Assistance Provided/Needed |
| There is no consensus among government decision makers on the potential for private investment through PPP projects and regional concessions.<br><br>There are no specific provisions for private transmission investment in the laws and regulations of Nigeria. | Build consensus within government on the path forward for private investment in transmission.<br><br>Identify and develop supporting regulations and legislation. | Assist TCN and BPE in outreach to the MoP, Federal Ministry of Finance, and NERC to promote private sector investment in transmission.<br><br>Work with BPE to develop a workable framework for transmission PPP in Nigeria |

| **TABLE 11: RECOMMENDED POLICY INTERVENTIONS BASED ON CURRENT TRANSACTIONS**<br>**Facilitate Transmission PPP Transactions** | | |
|---|---|---|
| Policy and Regulatory Barriers to Transaction(s) | Recommended Intervention(s) and Effects | Technical Assistance Provided/Needed |
| NERC has a poor track record in ensuring cost recovery for market participants | Develop a workable model for transmission PPP cost recovery. | Assist NERC to develop a framework for cost recovery for new transmission licensees.<br><br>If advisable, explore the possibility of NBET serving as off-taker for transmission PPPs. |
| No private investment is likely to occur until there is a clear tariff path for transmission investment recovery. | NERC will have to increase transmission tariffs to cost-reflective levels and restructure the TUOS tariff as a fixed charge. | Assist NERC to develop a tariff setting and cost recovery framework for transmission PPP.<br><br>Provide capacity building to NERC on best practices for transmission tariff setting process.<br><br>Provide transmission revenue requirements studies for transmission PPPs and concessions. |
| As yet, there is no consensus among government policy-makers on how to split TSP into regions and create regional transmission concessions. | Assist the government to develop and implement concessions for TSP. | Provide a study of alternatives for breaking up TCN and concessioning TSP on a regional basis.<br><br>Provide recommendations to BPE and FGN on same.<br><br>Help TCN and BPE/ICRC with the implementation of any recommended institutional changes.<br><br>Develop TCN restructuring plan and related transmission market model |
| BPE is likely to be the procurement agency and has a strong track record in managing bidding. | Work with government stakeholders to use fair and competitive procurement practices. | Assist BPE/ICRC to structure and implement PPP bidding. |

## A.7 ELECTRICITY DISTRIBUTION COMPANIES

**TABLE 12: RECOMMENDED POLICY INTERVENTIONS BASED ON CURRENT TRANSACTIONS**

**Electricity Distribution Companies**

| Policy and Regulatory Barriers to Transaction(s) | Recommended Intervention(s) and Effects | Technical Assistance Provided/Needed |
|---|---|---|
| The regulator has been very inconsistent and has not followed due process in its issuance of regulations, particularly with regards to the tariff. There have also been inconsistencies between different government agencies. This uncertainty has made it difficult for prospective lenders/investors to rely on any revenue projections. | Significantly increase regulatory support and technical assistance to the regulator through both an embedded advisory model and on a project basis. | Strong technical expertise with regards to tariff structuring and modelling in order to properly review revenue requirement/tariff applications.<br><br>NERC also requires technical, legal and regulatory assistance in creating investor-friendly regulations as well as adhering to due process in its rulemaking procedures, as these initiatives will boost investor confidence. |
| NERC has yet to agree with the DisCos on a cost-reflective tariff. Until then, there is no clear revenue stream for CAPEX funding. | NERC needs to finalize and implement the tariff for all electricity market participants. | NERC requires technical assistance in reviewing revenue requirement/tariff applications. |
| Most of the DisCos lack the technical and commercial expertise required to transform the companies from a deteriorating business into a profit-making enterprise. | The DisCos need turn-around experts that can achieve measured results, for example, reducing losses by a pre-determined percentage. | The DisCos require expertise in developing loss reduction measures and techniques specifically tailored to the unique features of the region. |
| Currently, this is not an impediment to the DisCo transactions, but may present an issue in the future if improvements along the electricity value chain do not coincide. For example, an increase in generation as a result of sustainable gas-to-power efforts should coincide with improvements in the transmission infrastructure in order to evacuate the increased generation capacity, as well as improvements in the distribution infrastructure to ensure that there are no technical constraints to delivering power to end-users. | This should be undertaken by the MOP in coordination with the Ministry of Oil & Petroleum Resources and assisted by PATRP. | Technical expertise in power sector planning that includes a comprehensive analysis of Nigeria's entire electricity value chain, such as region-specific bottlenecks with respect to inadequate gas pipeline infrastructure and weak transmission and distribution lines. |